REGULAR CITY COUNCIL MEETING
CITY COUNCIL CHAMBERS – CITY HALL
#1 CITY HALL PLACE

MONDAY, JUNE 8, 2026
5:30 PM

Individuals Requiring Special Accommodations Should Notify the City's ADA Coordinator at (719) 553-2295 by Noon on the Friday Preceding the Meeting.

A. CALL TO ORDER President Mark Aliff

B. INVOCATION Pastor Jerome Perkins, Christlife Ministries

C. PLEDGE OF ALLEGIANCE

D. ROLL CALL

E. SPECIAL RECOGNITIONS

E1 Proclamation Presentation: "NeighborWorks Weeks - May 23 - June 7, 2026" - Sandy Gutierrez, Chief Executive Officer

E2 Proclamation Presentation: "Leonardo da Vinci Day - June 12, 2026" - Joseph Arrigo, Founding Director & President; Gina Caruso, Deputy Director

F. PUBLIC FORUM

G. COUNCIL MEMBER AND MAYOR COMMENTARY

H. REVIEW OF AGENDA

I. APPROVAL OF AGENDA

Motion to Amend the Agenda or Motion to Approve the Agenda as distributed.

J. READING AND APPROVAL OF MINUTES

Motion to dispense with the reading and approve the Minutes of the Regular Meeting dated May 26, 2026, as distributed.

J1 City Council Minutes 052626

K. CONSENT AGENDA

All items listed in this portion of the agenda are considered to be routine by the City Council and will be enacted by one motion. There will be no separate discussion of these items unless a Councilperson so requests; in which event, the item will be removed from the Consent Agenda and considered under the Regular Agenda. Unless otherwise indicated, titles are self-explanatory.

L. COMMUNICATIONS

M. RESOLUTIONS

M1 A Resolution awarding a construction contract in the amount of $391,098.90 to Tony J Beltramo & Sons, Inc., for Project No. 26-021, Construct Model Aircraft Runway Facility, setting forth $8,500 for contingencies, and authorizing the Purchasing Agent to execute same

M2 A Resolution approving Amendment No. 1 of the Agreement for Professional Services between the City of Pueblo, a Colorado Municipal Corporation, and GSG Architecture, Inc., in the amount of $30,575 for Project No. 25-059, Design for Limited Remodel of Fire Stations #3 and #5, and authorizing the Purchasing Agent to execute same

M3 A Resolution ratifying an emergency construction contract in the amount of $6,831.00 with Parker Excavating, Inc., for Emergency Sanitary Sewer Point Repair at 716 McCulley Ave, Project No. 24-033 (WWAN03) and approving the purchasing agent’s execution of the same.

M4 A Resolution authorizing the issuance of Revocable Permit (REV-26-15) to the Diocese of Pueblo for the use of the public right-of-way along the 400 block of Clark Street on the west side and the 800 block of East "B" Street on the north side for the purpose of hosting Our Lady of Mount Carmel's annual festival and procession

M5 A Resolution confirming the reappointment by the Mayor of Yvonne Lujan-Slak to serve a four-year term expiring June 30, 2030, on the Zoning Board of Appeals

M6 A Resolution confirming the reappointment by the Mayor of Phyllis Sanchez to serve a five-year term expiring July 1, 2031, on the Housing Authority of the City of Pueblo Board of Directors

M7 A Resolution confirming the reappointment of Cheryl Spinuzzi and the appointment of Jane Cawlfield to serve a four-year term expiring July 1, 2030, on the Planning & Zoning Commission

M8 A Resolution confirming the appointment by the Mayor of Anthony Garcia and CiCi Sparkman to complete a four-year term expiring August 30, 2029, on the ADA Advisory Committee

N. ORDINANCES – FIRST PRESENTATION

N1 An Ordinance amending Title IV of the Pueblo Municipal Code by creating a new Chapter 12 relating to Energy Code; adopting by reference the Colorado Model Electric Ready and Solar Ready Code; amending Section 4-1-2 of the Pueblo Municipal Code to add the Colorado Model Electric Ready And Solar Ready Code to the list of minor or secondary codes; and providing penalties and remedies for the violation thereof

N2 An Ordinance amending Chapter 12 of Title IV of the Pueblo Municipal Code by adopting by reference the 2021 International Energy Conservation Code; amending Sections 4-2-1 and 4-2-2 of the Pueblo Municipal Code to reflect the relocation of the International Energy Conservation Code; amending Section 4-1-2 of the Pueblo Municipal Code; and providing penalties and remedies for the violation thereof

N3 An Ordinance amending Section 4-6-2 of the Pueblo Municipal Code by repealing local amendments to Chapter 11 of the 2021 International Residential Code

N4 An Ordinance approving an Economic Development Agreement between the City of Pueblo, a Colorado Municipal Corporation and Pueblo Steam Works dba Southern Colorado Science Center dba Leonardo Da Vinci Museum of North America, a Colorado Nonprofit Corporation and authorizing the Mayor to execute the same; establishing Project

No. ED2602 - Leonardo Da Vinci Museum; and budgeting and appropriating $1,817,044 from the unencumbered fund balance of the 1992-2031 Sales and Use Tax Capital Improvement Projects Fund to Project No. ED2602 - Leonardo Da Vinci Museum

N5 An Ordinance amending Section 11-1-406 of the Pueblo Municipal Code to classify trespass and to make trespass to a dwelling or a vacant building a Class 1 municipal offense

N6 An Ordinance establishing Project NO. FF2601 (Federal Forfeiture Equipment), transferring $136,000 from the Unencumbered Federal Forfeiture Fund balance to Project FF2601 and budgeting and appropriating $136,000 for use and benefit of the Police Department

N7 An Ordinance transferring, budgeting and appropriating insurance proceeds in the amount of $444,857 into Capital Project No. CI2513 - Ice Arena Roof Repair CIRSA, awarding a construction contract in the amount of $369,857.00 to L.E. Roofing, LLC, for Account Project No. 26-023 Roof Retrofit Project - Pueblo Ice Arena, setting forth $75,000.00 for contingencies, and authorizing the Purchasing Agent to execute same

N8 An Ordinance designating 515 W Northern Ave, Ianne's Pizzeria, as a local historic landmark

N9 An Ordinance amending zoning restrictions to rezone 4.7-acres located at 3210 W. 31st St. from Agricultural (A-1) to Multiple Residential and Office (R-5) Zone District

N10 An Ordinance amending Zoning Restrictions to Rezone of 634 Goodnight Ave from Sub-Regional Business (B-2) Zone District to Single-Family Residential (R-2) Zone District

N11 An Ordinance Amending Zoning Restrictions to Rezone 0.37 Acres Located At 229 W. 12th St. From Multiple Residential And Office District (R-5) Zone District To Neighborhood Business (B-1) Zone District

N12 An Ordinance approving and accepting Airport Infrastructure Grant (AIG) Grant Agreement No. 3-08-0046-054-2026 for funds in the amount of $285,000 and Airport Improvement Program (AIP) Grant Agreement No. 3-08-0046-055-2026 for funds in the amount of $119,003 from the United States of America acting through the Federal Aviation Administration for costs related to the PUB Taxiway A Sealcoat (Phase 1) project at the Pueblo Memorial Airport, budgeting and appropriating $404,003 to Project No. AP2603 – PUB Taxiway A Sealcoat, and authorizing the mayor to execute same

N13 An Ordinance approving a T-Hangar Lease Agreement between the City of Pueblo, a Colorado Home Rule Municipal Corporation, and Jason Parker for Hangar Unit H at 31501 Bryan Circle at Pueblo Memorial Airport

N14 An Ordinance approving a Second Amendment to Lease Improved Property for the use of land at the Pueblo Memorial Airport between the City of Pueblo, a Colorado Home Rule Municipal Corporation, and the State of Colorado Department of Public Safety, Division of Fire Prevention and Control, and authorizing the Mayor to execute the same.

N15 An Ordinance awarding and approving an agreement between the City of Pueblo, a Colorado Municipal Corporation, and SafeSide Foundation, a Colorado Non-profit Corporation, for community services in the amount of $210,000.00, from project account HOARP40, HOME-ARP City Projects

N16 An Ordinance repealing Chapter 2, Title III of the Pueblo Municipal Code relating to and adopting a new Chapter 2, Title III of the 2021 International Fire Code published by the International Code Council, Inc., 4051 Flossmoor Road, Country Club Hills, Il 60478, along with certain amendments thereto and providing remedies and penalties for the violation

thereof

N17 An Ordinance approving and accepting the conveyance of two parcels of real property located at 350 Keeler Parkway and 442 Keeler Parkway from Pueblo Development Foundation to the City of Pueblo, approving a Release of Deed of Trust for each property and authorizing the Mayor to execute the same

N18 An Ordinance approving a Memorandum of Understanding between the City of Pueblo, a Colorado Municipal Corporation, and a corporation referred to as Project Falcon concerning a potential economic development project

N19 An Ordinance approving a Short-Term Loan Agreement between the City of Pueblo, a Colorado Municipal Corporation and Design For Recycle, LLC, a Colorado limited liability company for a short-term loan to support regional recycling capacity and landfill diversion, and authorizing the Mayor to execute same; establishing Project No. PB2601 – Design For Recycle; and budgeting and appropriating funds from the Plastic Pollution Reduction Fund to Project No PB2601 – Design For Recycle

N20 An Ordinance (1) approving and authorizing the Mayor to execute an Employment Agreement between the City of Pueblo, a Colorado municipal corporation and Transportation Technology Center, Inc., a Delaware corporation, relating to a job creating capital improvement project and (2) approving and authorizing the Mayor to execute a Contract to Buy and Sell Real Estate between the City of Pueblo, a Colorado municipal corporation and Transportation Technology Center, Inc., a Delaware corporation, and related Special Warranty Deed relating to a parcel of improved land located in the Pueblo Memorial Airport Industrial Park – 350 Keeler Parkway

O. APPROVAL OF CONSENT AGENDA

I move to approve all Resolutions Set Forth in the Consent Agenda; Pass the Ordinances of the Consent Agenda, Setting the Public Hearings for June 22, 2026, and Order the Ordinances to be published BY TITLE.

P. REGULAR AGENDA

Q. RESOLUTIONS

Q1 A Resolution awarding a construction contract in the amount of $759,970.00 to Miller Pipeline LLC for Project No. 26-028 (WWAN05) 2026 Manhole Rehabilitation Project, setting forth $151,994.00 for contingencies and authorizing the Purchasing Agent to execute the same

Q2 A Resolution authorizing payment from the council contingencies account in the 2026 general fund budget to Mariposa Center for Safety in the amount of $1,700, to sponsor the 25th Annual Tribute to Women from 6:00-9:00 PM at the Pueblo Union Depot on Saturday, October 10, 2026

Q3 A Resolution authorizing payment from the council contingencies account in the 2026 general fund budget to National Association of Letter Carriers in the amount of $1,500 to sponsor the 6th Annual NALC Golf Tournament at 8:00 am at Elmwood Golf Course on Sunday, June 28, 2026

Q4 A Resolution authorizing payment from the council contingencies account in the 2026 general fund budget to Pueblo Symphony Association in the amount of $2,500 to sponsor the 2026 Pueblo’s Fabulous 4th Outdoor Concert at 7:00 PM at Colorado State University Pueblo on Saturday, July 4, 2026

Q5 A Resolution authorizing payment from the council contingencies account in the 2026 general fund budget to Pueblo Zoological Society (DBA Pueblo Zoo) in the amount of

$1,800 to sponsor Zoofari at 4:30 PM at the Pueblo Zoo on Saturday, June 20th, 2026

R. ORDINANCES – FINAL PRESENTATION

R1 An Ordinance approving the 3rd Amendment to the Intergovernmental Agreement between the City of Pueblo, a Colorado Municipal Corporation ("City"), and the State of Colorado, acting by and through the Colorado Department of Transportation ("CDOT"), Project TAP M086-091 (24079)/MTF M086-088 (24024) for the Prairie Avenue to Minnequa Lake Trail Project, decreasing the funding from $1,410,542.00 to $1,354,010.04 and authorizing the Mayor to execute same - *Introduced May 26, 2026 by Councilor Brett Boston*

R2 An Ordinance approving the 1st Amendment to the Intergovernmental Agreement between the City of Pueblo, a Colorado Municipal Corporation ("City"), and the State of Colorado, acting by and through the Colorado Department of Transportation ("CDOT"), Adams and Jackson Roundabout Project SHO M086-093 (24462), decreasing the funding from $1,000,000 to $832,016.09 and authorizing the Mayor to execute same - *Introduced May 26, 2026 by Councilor Brett Boston*

R3 An Ordinance amending Section 607 of Chapter 1 of Title XI of the Pueblo Municipal Code relating to noise and clarifying and recognizing consistent with state statute its nonapplication to the State, political subdivisions of the State and nonprofits - *Introduced May 26, 2026 by Councilor Brett Boston*

R4 An Ordinance approving and adopting the City of Pueblo's 2026 Action Plan for the Community Development Block Grant (CDBG) and the Home Investment Partnership Act Grant (HOME), authorizing the Mayor of the City of Pueblo to submit the application together with all required and necessary certifications, assurances, and documentation to the U.S. Department of Housing and Urban Development, and appropriating and budgeting CDBG and HOME funds therefore and authorizing the Mayor to execute subrecipient agreements for community development services - *Introduced May 26, 2026 by Councilor Brett Boston*

R5 An Ordinance amending the fiscal year 2026 staffing ordinance by adding one (1) full-time position entitled Housing Redevelopment Program Coordinator to the authorized staffing of the Housing and Citizen Services Department - *Introduced May 26, 2026 by Councilor Brett Boston*

R6 An Ordinance amending section 6-5-16 of Chapter 5, of Title VI of the Pueblo Municipal Code relating to the FY 2026 classification and pay plan by establishing the pay scale for Housing Redevelopment Program Coordinator - *Introduced May 26, 2026 by Councilor Brett Boston*

R7 An Ordinance approving a T-Hangar Lease Agreement between the City of Pueblo, a Colorado Home Rule Municipal Corporation, and Daniel J. Ramos for Hangar Unit B at 31501 Bryan Circle at Pueblo Memorial Airport - *Introduced May 26, 2026 by Councilor Brett Boston*

R8 An Ordinance authorizing the City of Pueblo to grant a Conditional Waiver of Fees relating to Wastewater Connection Fees totaling a maximum of $236,170 for Phase II of the Pueblo Springs Apartments located in the southeast corner of the Pueblo Springs Apartments Subdivision - *Introduced May 26, 2026 by Councilor Brett Boston*

R9 An Ordinance accepting, approving and authorizing the Mayor to execute LPC-24-055 Pueblo Affordable Housing Procedure updates State of Colorado Grant Agreement Modification, Grant Agreement Amendment #1., and budgeting and appropriating incentive funds in the amount of $50,000 into PL2402 - *Introduced May 26, 2026 by Councilor Brett Boston*

R10 An Ordinance approving a Memorandum of Understanding between the City of Pueblo and the Bureau of Alcohol, Tobacco, Firearms and Explosives regarding the NIBN National Correlation and Training Center - *Introduced May 26, 2026 by Councilor Brett Boston*

R11 An Ordinance approving a Memorandum of Understanding between the City of Pueblo and the Bureau of Alcohol, Tobacco, Firearms, and Explosives regarding the National Integrated Ballistic Information Network - *Introduced May 26, 2026 by Councilor Brett Boston*

R12 An Ordinance approving the contribution of $215,000 in support of the Fallen Officer Memorial, establishing Project CI2615 - Fallen Officer Memorial, Transferring $150,000 from Pueblo Police Department Wages/Police Service Account 10120502-51030 to Project CI2615, and transferring funds in the amount of $65,000 from project account CI2113 - ARPA Interest to Project CI2615 - *Introduced May 26, 2026 by Councilor Brett Boston*

S. ADJOURN

Proclamation

"NeighborWorks Weeks"

May 23-June 7, 2026

WHEREAS: NeighborWorks Weeks highlights the work of local organizations that engage residents, develop strong public and private partnerships, and expand access to safe, stable, and affordable housing so individuals and families can thrive; and

WHEREAS: NeighborWorks Weeks was first established in 1983 by a U.S. congressional resolution co-sponsored by nearly 250 members of Congress and signed by President Ronald Reagan, recognizing the importance of community-based housing and neighborhood development; and

WHEREAS: NeighborWorks Weeks is a national celebration engaging nearly 250 organizations across all 50 states, the District of Columbia, Puerto Rico, and Tribal lands in activities that promote housing stability, financial capability, and community investment; and

WHEREAS: NeighborWorks Southern Colorado, a proud member of the NeighborWorks network, has served the community of Pueblo, Colorado since 1977. NeighborWorks Southern Colorado is committed to empowering communities with trusted resources for housing, financial support, small business lending, and education; and promoting THRIVING, VIBRANT, SUSTAINABLE communities.

NOW, THEREFORE, WE, the City Council of the City of Pueblo, Colorado, by the authority vested in us, do hereby proclaim May 23-June 7, 2026, as **"NeighborWorks Weeks"** in the City of Pueblo, Colorado.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the City of Pueblo, Colorado, to be affixed this 8th day of June 2026.



Mark Aliff
President of the City Council

Proclamation

"Leonardo da Vinci Day"

June 12, 2026

WHEREAS: The Leonardo da Vinci Museum of North America officially opens on June 12, 2026, east of the Historic Arkansas Riverwalk of Pueblo, adjacent to the Pueblo Convention Center; and

WHEREAS: The museum's main exhibit features hands-on models of machines inspired by Leonardo's sketches, alongside some of his most recognized paintings, to spark curiosity and wonder among all generations. The museum will also house his complete collection of notes and sketches, curated by Giunti Publishing in Florence, Italy; and

WHEREAS: The exhibit collection is built in partnership with the Artisans of Florence, masters in reconstructing Leonardo's inventions directly from his original codices. These master builders transform centuries-old designs into full-scale, functional models using traditional Renaissance materials and techniques; and

WHEREAS: Pueblo is the ideal location for this museum, with a legacy of ingenuity from its industrial heritage to today's revitalized Riverwalk and growing arts and education community, rooted in generations of makers, builders, and problem-solvers; and

WHEREAS: The Leonardo da Vinci Museum of North America & STEAM Center is launching an innovative initiative to transform educational opportunities across Southern Colorado, offering educational programs, after school clubs, workshops, and camps for K–12 students focusing on science, technology, engineering, art, and math; and

WHEREAS: The museum collaborates with other Leonardo da Vinci museums across the globe in Sokcho, South Korea, Brasilia, Brazil, Florence, Italy, and Melbourne, Australia, establishing a pathway for cultural exchange and shared innovation.

NOW, THEREFORE, WE, the Board of County Commissioners of the County of Pueblo, Colorado, and the City Council of the City of Pueblo, Colorado by the authority vested in us, do hereby proclaim June 12, 2026, as **"Leonardo da Vinci Day"** in the City and County of Pueblo.

IN WITNESS WHEREOF, WE have hereunto set our hands and caused the Seals of the City and County of Pueblo, Colorado, to be affixed this 8th day of June 2026.

Mark Aliff
President, City Council

Zach Swearingen
Chairman, Board of County Commissioners

REGULAR CITY COUNCIL MEETING
CITY COUNCIL CHAMBERS – CITY HALL
#1 CITY HALL PLACE
TUESDAY, MAY 26, 2026 - 5:30 PM

MINUTES

A. CALL TO ORDER

President Aliff called the meeting to order at p.m.

B. INVOCATION

C. PLEDGE OF ALLEGIANCE

D. ROLL CALL

Council Members Present: Mark Aliff, Brett Boston, Roger Gomez, Joe Latino, Ted Hernandez, Dianne Danti, Selena Ruiz-Gomez.

Council Members Present via Zoom: None.

Council Members Absent: None.

Administrative Staff Members Present: Mayor Heather Graham, Chief of Staff Brian McCain, City Attorney Carla Sikes, City Clerk Clyde Bishop.

E. SPECIAL RECOGNITIONS

F. PUBLIC FORUM

Brett Verna spoke about economic development / advance pueblo.

Elvis Martinez spoke about animals and the airport.

Roxana Mack spoke about the Italian Flag being flown next to the American Flag.

G. COUNCIL MEMBER AND MAYOR COMMENTARY

Council members expressed comments regarding community-related issues and events/functions they attended.

H. REVIEW AND APPROVAL OF AGENDA

I. READING AND APPROVAL OF MINUTES

I1 CITY COUNCIL MINUTES 051126

Councilor Boston, seconded by Councilor Gomez, moved to dispense with the reading and approve the Minutes of the Regular Meeting dated **May 11, 2026,** as distributed.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Gomez, Councilor Latino, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** None. Motion Passed 7-0.

J. PUBLIC HEARINGS

J1 PUBLIC HEARING FOR THE PURPOSE OF RECEIVING PUBLIC TESTIMONY AS IT PERTAINS TO THE CITY OF PUEBLO PREPARING ITS FY 2026 ANNUAL ACTION PLAN (AAP) FOR THE PROGRAM YEAR RUNNING SEPTEMBER 1, 2026–AUGUST 31, 2027 FOR FY 2026 COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG) AND HOME INVESTMENT PARTNERSHIPS PROGRAM (HOME) FUNDS FROM THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD). IN ACCORDANCE WITH 24 CFR PART 91, THE FY 2026 AAP WILL BE SUBMITTED TO HUD ON OR BEFORE JULY 18, 2026

REQUIRED COUNCIL ACTION: OPEN THE HEARING, RECEIVE PUBLIC TESTIMONY, AND CLOSE THE HEARING

A staff report and detailed review of the Ordinance was given by Lexi Romero-Stewart, Housing and Community Development Specialist.

PUBLIC HEARING:

Seeing no one wished to speak, President Aliff declared the hearing closed.

K. CONSENT AGENDA

City Clerk Clyde Bishop read the Consent Agenda into the record.

L. COMMUNICATIONS

L1 MINUTES OF THE PLANNING AND ZONING COMMISSION MEETING FOR 3/11/2026

M. RESOLUTIONS

M1 A RESOLUTION APPROVING AMENDMENT NO. 1 OF THE AGREEMENT FOR PROFESSIONAL SERVICES BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, AND GALLOWAY & COMPANY, LLC, IN THE AMOUNT OF $6,000 FOR PROJECT NO. R26-048 (PREVIOUSLY LISTED AS 26-013), FIRE STATION COMMISSIONING SERVICE, AND AUTHORIZING THE PURCHASING AGENT TO EXECUTE SAME

This Resolution was assigned as **16328**.

M2 A RESOLUTION AUTHORIZING THE ISSUANCE OF A REVOCABLE PERMIT (REV-26-7) TO THE INTERNATIONAL SOAP BOX DERBY/PIKES PEAK SOAP BOX DERBY FOR THE USE OF JOPLIN HILL STARTING JUST NORTH OF E. 3RD ST. AND ENDING JUST SOUTH OF E ASH ST., BLOCKING INTERSECTING STREETS E. 3RD ST. E. 2ND ST., E 1ST ST., E. RIVER ST. AND E ASH ST. TO HOST THE SOAP BOX DERBY

This Resolution was assigned as **16329**.

M3 A RESOLUTION AUTHORIZING THE ISSUANCE OF A REVOCABLE PERMIT (REV-26-13) TO THE CITY OF PUEBLO PARKS & REC FOR THE USE OF THE PUBLIC RIGHT-OF-WAY ALONG CARLILE AVENUE CLOSED FROM GOODNIGHT AVENUE EXTENDING NORTH THEN EAST TO CARLILE AVENUE TO CITY PARK AVENUE FOR THE PURPOSE OF HOSTING THE STEEL CITY ARKANSAS RIVER FESTIVAL

This Resolution was assigned as **16330**.

M4 A RESOLUTION CONFIRMING THE APPOINTMENT BY THE MAYOR OF PATRICK MILLER TO COMPLETE A FOUR-YEAR TERM EXPIRING AUGUST 1, 2029, ON THE HONOR FARM ENTERPRISE CITIZENS ADVISORY BOARD

This Resolution was assigned as **16331**.

M5 A RESOLUTION CONFIRMING THE APPOINTMENT BY THE MAYOR OF DOMONIQUE CHAVEZ AND CHING HAN HELEN CHAN TO COMPLETE A THREE-YEAR TERM EXPIRING DECEMBER 31, 2028, ON THE PUEBLO HUMAN RELATIONS COMMISSION

This Resolution was assigned as **16332**.

N. ORDINANCES – FIRST PRESENTATION

N1 AN ORDINANCE APPROVING THE 3RD AMENDMENT TO THE INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION ("CITY"), AND THE STATE OF COLORADO, ACTING BY AND THROUGH THE COLORADO DEPARTMENT OF TRANSPORTATION ("CDOT"), PROJECT TAP M086-091 (24079)/MTF M086-088 (24024) FOR THE PRAIRIE AVENUE TO MINNEQUA LAKE TRAIL PROJECT, DECREASING THE FUNDING FROM $1,410,542.00 TO $1,354,010.04 AND AUTHORIZING THE MAYOR TO EXECUTE SAME

N2 AN ORDINANCE APPROVING THE 1ST AMENDMENT TO THE INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION ("CITY"), AND THE STATE OF COLORADO, ACTING BY AND THROUGH THE COLORADO DEPARTMENT OF TRANSPORTATION ("CDOT"), ADAMS AND JACKSON ROUNDABOUT PROJECT SHO M086-093 (24462), DECREASING THE FUNDING FROM $1,000,000 TO $832,016.09 AND AUTHORIZING THE MAYOR TO EXECUTE SAME

N3 AN ORDINANCE AMENDING SECTION 607 OF CHAPTER 1 OF TITLE XI OF THE PUEBLO MUNICIPAL CODE RELATING TO NOISE AND CLARIFYING AND RECOGNIZING CONSISTENT WITH STATE STATUTE ITS NONAPPLICATION TO THE STATE, POLITICAL SUBDIVISIONS OF THE STATE AND NONPROFITS

N4 AN ORDINANCE APPROVING AND ADOPTING THE CITY OF PUEBLO'S 2026 ACTION PLAN FOR THE COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG) AND THE HOME INVESTMENT PARTNERSHIP ACT GRANT (HOME), AUTHORIZING THE MAYOR OF THE CITY OF PUEBLO TO SUBMIT THE APPLICATION TOGETHER WITH ALL REQUIRED AND NECESSARY CERTIFICATIONS, ASSURANCES, AND DOCUMENTATION TO THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, AND APPROPRIATING AND BUDGETING CDBG AND HOME FUNDS THEREFORE AND AUTHORIZING THE MAYOR TO EXECUTE SUBRECIPIENT AGREEMENTS FOR COMMUNITY DEVELOPMENT SERVICES

N5 AN ORDINANCE AMENDING THE FISCAL YEAR 2026 STAFFING ORDINANCE BY ADDING ONE (1) FULL-TIME POSITION ENTITLED HOUSING REDEVELOPMENT PROGRAM COORDINATOR TO THE AUTHORIZED STAFFING OF THE HOUSING AND CITIZEN SERVICES DEPARTMENT

N6 AN ORDINANCE AMENDING SECTION 6-5-16 OF CHAPTER 5, OF TITLE VI OF THE PUEBLO MUNICIPAL CODE RELATING TO THE FY 2026 CLASSIFICATION AND PAY PLAN BY ESTABLISHING THE PAY SCALE FOR HOUSING REDEVELOPMENT PROGRAM COORDINATOR

N7 AN ORDINANCE APPROVING A T-HANGAR LEASE AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO HOME RULE MUNICIPAL CORPORATION, AND DANIEL J. RAMOS FOR HANGAR UNIT B AT 31501 BRYAN CIRCLE AT PUEBLO MEMORIAL AIRPORT

N8 AN ORDINANCE AUTHORIZING THE CITY OF PUEBLO TO GRANT A CONDITIONAL WAIVER OF FEES RELATING TO WASTEWATER CONNECTION FEES TOTALING A MAXIMUM OF $236,170 FOR PHASE II OF THE PUEBLO SPRINGS APARTMENTS LOCATED IN THE SOUTHEAST CORNER OF THE PUEBLO SPRINGS APARTMENTS SUBDIVISION

N9 AN ORDINANCE ACCEPTING, APPROVING AND AUTHORIZING THE MAYOR TO EXECUTE LPC-24-055 PUEBLO AFFORDABLE HOUSING PROCEDURE UPDATES STATE OF COLORADO GRANT AGREEMENT MODIFICATION, GRANT AGREEMENT AMENDMENT #1., AND BUDGETING AND APPROPRIATING INCENTIVE FUNDS IN THE AMOUNT OF $50,000 INTO PL2402

N10 AN ORDINANCE APPROVING A MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF PUEBLO AND THE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES REGARDING THE NIBN NATIONAL CORRELATION AND TRAINING CENTER

N11 AN ORDINANCE APPROVING A MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF PUEBLO AND THE BUREAU OF ALCOHOL, TOBACCO, FIREARMS, AND EXPLOSIVES REGARDING THE NATIONAL INTEGRATED BALLISTIC INFORMATION NETWORK

N12 AN ORDINANCE APPROVING THE CONTRIBUTION OF $215,000 IN SUPPORT OF THE FALLEN OFFICER MEMORIAL, ESTABLISHING PROJECT CI2615 - FALLEN OFFICER MEMORIAL, TRANSFERRING $150,000 FROM PUEBLO POLICE DEPARTMENT WAGES/POLICE SERVICE ACCOUNT 10120502-51030 TO PROJECT CI2615, AND TRANSFERRING FUNDS IN THE AMOUNT OF $65,000 FROM PROJECT ACCOUNT CI2113 - ARPA INTEREST TO PROJECT CI2615.

O. APPROVAL OF CONSENT AGENDA

P. REGULAR AGENDA

Q. RESOLUTIONS

Q1 A RESOLUTION APPROVING AMENDMENT NO. 3 TO THE AGREEMENT FOR PROFESSIONAL ENGINEERING SERVICES IN THE AMOUNT OF $719,230.00 BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, AND RESPEC COMPANY, LLC, A SOUTH DAKOTA LIMITED LIABILITY COMPANY, FOR PROJECT NO. 24-098 STATE FAIR AND BESSEMER NEIGHBORHOOD DRAINAGE IMPROVEMENTS DESIGN AND ANALYSIS AND AUTHORIZING THE PURCHASING AGENT TO EXECUTE THE SAME

A staff report and detailed review of the Resolution was given by Kurt Patrick, Director of Stormwater.

Councilor Latino, seconded by Councilor Gomez, moved to approve the Resolution.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Gomez, Councilor Latino, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** None. Motion Passed 7-0.

This Resolution was assigned as **16333**.

R. QUASI-JUDICIAL PROCEEDINGS

R1 AN ORDINANCE AMENDING ZONING RESTRICTIONS TO REZONE LOT 10, BLOCK 5, SHULLS SUBDIVISION FROM O-1, NEIGHBORHOOD OFFICE ZONE DISTRICT TO R-2, SINGLE-FAMILY RESIDENTIAL ZONE DISTRICT

A staff report and detailed review of the Ordinance was given by Beritt Odom, Director of Planning & Community Development. Ms. Odom requested that the Planning & Zoning documents for this item, Case # Z-25-20 dated February 11, 2026, be made part of the record for this hearing. So ordered by President Aliff.

PUBLIC HEARING:

- Rich Pelicki appeared in person and spoke in favor of this Ordinance.
- Randy Reeves appeared in person and spoke in favor of this Ordinance.

Seeing no one else wishing to speak, President Aliff declared the hearing closed.

Councilor Gomez, seconded by Councilor Latino, moved to approve the Ordinance on final presentation.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Gomez, Councilor Latino, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** None. Motion Passed 7-0.

This Ordinance was assigned as **11175.**

R2 AN ORDINANCE APPROVING THE PELLECCHIA SUBDIVISION

A staff report and detailed review of the Ordinance was given by Beritt Odom, Director of Planning & Community Development. Ms. Odom requested that the Planning & Zoning documents for this item, Case # S-25-06 dated February 11, 2026, be made part of the record for this hearing. So ordered by President Aliff.

PUBLIC HEARING:

Seeing no one wished to speak, President Aliff declared the hearing closed.

Councilor Gomez, seconded by Councilor Danti, moved to approve the Ordinance on final presentation.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Gomez, Councilor Latino, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** None. Motion Passed 7-0.

This Ordinance was assigned as **11176.**

S. ORDINANCES – FINAL PRESENTATION

S1 AN ORDINANCE AMENDING SECTION 15-1-6 OF THE PUEBLO MUNICIPAL CODE RELATING TO MOTORIZED VEHICLES UPON BIKEPATHS

A staff report and detailed review of the Ordinance was given by Steven Meier, Director of Parks and Recreation.

PUBLIC HEARING:

Seeing no one wished to speak, President Aliff declared the Hearing closed.

Councilor Latino, seconded by Councilor Danti, moved to approve the Ordinance on final presentation.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Gomez, Councilor Latino, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** None. Motion

Passed 7-0.

This Ordinance was assigned as **11177.**

S2 AN ORDINANCE APPROVING AND ACCEPTING COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) AERONAUTICS DIVISION GRANT NO. 26-PUB-01 FOR FUNDS IN THE AMOUNT OF $20,359 FOR THE TAXIWAY A SEALCOAT (PHASE I) PROJECT DESIGN, BID, AND SEALCOAT, BUDGETING AND APPROPRIATING SAID FUNDS TO PROJECT NO. AP2603 – PUB TAXIWAY A SEALCOAT PROJECT

A staff report and detailed review of the Ordinance was given by Greg Pedroza, Director of Aviation.

PUBLIC HEARING:

Seeing no one wished to speak, President Aliff declared the hearing closed.

Councilor Latino, seconded by Councilor Danti, moved to approve the Ordinance on final presentation.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Gomez, Councilor Latino, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** None. Motion Passed 7-0.

This Ordinance was assigned as **11178.**

S3 AN ORDINANCE APPROVING A 2ND AMENDMENT TO AN INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF PUEBLO ("CITY"), A COLORADO MUNICIPAL CORPORATION, AND THE FEDERAL HIGHWAY ADMINISTRATION ("FHWA"), FROM THE RAISE GRANT PROGRAM, AWARD NUMBER 693JJ32440495, RELATING TO THE WEST SIDE CONNECTOR PROJECT, AND AUTHORIZING THE MAYOR TO EXECUTE SAME

A staff report and detailed review of the Ordinance was given by Andrew Hayes, Director of Public Works.

PUBLIC HEARING:

Seeing no one wished to speak, President Aliff declared the hearing closed.

Councilor Latino, seconded by Councilor Danti, moved to approve the Ordinance on final presentation.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Gomez, Councilor Latino, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** None. Motion Passed 7-0.

This Ordinance was assigned as **11179.**

S4 AN ORDINANCE APPROVING A MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, FRIENDS OF CITY PARK, A COLORADO NONPROFIT CORPORATION, AND HISTORIC PUEBLO, INC., A COLORADO NONPROFIT CORPORATION FOR THE RENOVATION OF THE CITY PARK BATH HOUSE

AND AUTHORIZING THE MAYOR TO EXECUTE SAID MEMORANDUM OF UNDERSTANDING

A staff report and detailed review of the Ordinance was given by Carla Sikes, City Attorney.

PUBLIC HEARING:

- George Koncilja appeared in person and spoke in favor of this Ordinance.
- Eleanor Bartoli appeared in person and spoke in favor of this Ordinance.
- Elvis Martinez appeared in person and spoke in favor of this Ordinance.

Seeing no one else wishing to speak, President Aliff declared the hearing closed.

Councilor Latino, seconded by Councilor Hernandez, moved to approve the Ordinance on final presentation.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Gomez, Councilor Latino, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** None. Motion Passed 7-0.

This Ordinance was assigned as **11180.**

S5 AN ORDINANCE TRANSFERRING FUNDS IN THE AMOUNT OF $25,000 FROM PROJECT ACCOUNT HU9999, FASTER PROJECTS TO BE DETERMINED TO HU2603, WEST SIDE CONNECTOR, APPROVING A PRELIMINARY ENGINEERING SERVICES AGREEMENT BETWEEN BNSF RAILWAY COMPANY, A DELAWARE CORPORATION, AND THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, RELATING TO PRELIMINARY ENGINEERING WORK WITH RESPECT TO BUILDING AN OVERPASS ACROSS THE BNSF RAILROAD TRACK AT WEST 24TH STREET AND AUTHORIZING EXECUTION THEREOF BY THE MAYOR

A staff report and detailed review of the Ordinance was given by Andrew Hayes, Director of Public Works.

PUBLIC HEARING:

Seeing no one wished to speak, President Aliff declared the hearing closed.

Councilor Latino, seconded by Councilor Ruiz-Gomez, moved to approve the Ordinance on final presentation.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Gomez, Councilor Latino, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** None. Motion Passed 7-0.

This Ordinance was assigned as **11181.**

S6 AN ORDINANCE APPROVING AND AUTHORIZING THE MAYOR TO EXECUTE A DONATION AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, AND MORNING STAR CREATIONS, INC., A COLORADO CORPORATION; CREATING A NEW PROJECT ACCOUNT CI2614 - VINEWOOD SKATE PARK; AND ACCEPTING, BUDGETING, AND

APPROPRIATING FUNDS IN THE AMOUNT OF $70,000.00 INTO PROJECT CI2614 - VINEWOOD SKATE PARK

A staff report and detailed review of the Ordinance was given by Andrew Hayes, Director of Public Works.

PUBLIC HEARING:

- Elvis Martinez appeared in person and spoke in favor of this Ordinance.
- Eleanor Bartoli appeared in person and spoke in favor of this Ordinance.
- Bret Verna appeared in person and spoke in favor of this Ordinance**.**

Seeing no one else wishing to speak, President Aliff declared the hearing closed.

Councilor Latino, seconded by Councilor Ruiz-Gomez, moved to approve the Ordinance on final presentation.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Gomez, Councilor Latino, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** None. Motion 7-0.

This Ordinance was assigned as **11182.**

T. COUNCIL MEMBER CONFLICT OF INTEREST

U. COMMUNICATIONS

U1 A CITIZEN FILED AN ETHICS COMPLAINT AGAINST COUNCILOR JOE LATINO

Councilor Latino left the Dias.

A staff report and detailed review were given by Harley Gifford, Deputy City Attorney..

Councilor Ruiz-Gomez, seconded by Councilor Danti, moved to accept the communication.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Hernandez, Councilor Danti, Councilor Ruiz-Gomez. **Nays:** Councilor Gomez. Motion Passed 5-1.

Councilor Gomez, seconded by Councilor Hernandez, moved to dismiss the communication.

Roll Call - **Ayes:** President Aliff, Councilor Boston, Councilor Hernandez, Councilor Gomez, Councilor Ruiz-Gomez. **Nays:** Councilor Danti,. Motion Passed 5-1.

V. ADJOURN

President Aliff adjourned the meeting at 7:03 p.m.

Respectfully submitted,
Clyde Bishop

Clyde Bishop

Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Andrew Hayes, Public Works Director

SUBJECT: A RESOLUTION AWARDING A CONSTRUCTION CONTRACT IN THE AMOUNT OF $391,098.90 TO TONY J BELTRAMO & SONS, INC., FOR PROJECT NO. 26-021, CONSTRUCT MODEL AIRCRAFT RUNWAY FACILITY, SETTING FORTH $8,500 FOR CONTINGENCIES, AND AUTHORIZING THE PURCHASING AGENT TO EXECUTE SAME

SUMMARY:

This Resolution awards a construction contract to Tony J Beltramo & Sons, Inc., for Project No. 26-021 Construct Model Aircraft Runway Facility.

PREVIOUS COUNCIL ACTION:

Ordinance 11023, dated August 25, 2025, established a new project account (CI2516 - Sky Corral Runway Relocation), approved an Intergovernmental Agreement between Pueblo County and the City of Pueblo, accepted funds in the amount of $50,000.00 from Pueblo County, transferring funds in the amount of $50,000.00 from the City's general fund balance, and budgeting and appropriating $100,000.00 as well as any other funds, public or private, that may be received by the City in the future, for the purpose of constructing a new model airplane runway facility;

Ordinance 11159, dated April 27, 2026, approved a Donation Agreement between the City of Pueblo and Baxter Kirkland and Brianna Kirkland outlining terms and conditions relating to a private donation for the Sky Corral Runway Relocation Project.

BACKGROUND:

With Pueblo County's recent project to construct Medal of Honor Boulevard connecting Joe Martinez Boulevard in Pueblo West to Pueblo Boulevard, the City-owned remote control aircraft runway facility located on the Honor Farm property on the west side of the City was relocated to ensure the safe operation of remote control aircraft at the facility. Baxter Kirkland and Brianna Kirkland provided a donation of $100,000.00 towards the project.

The City of Pueblo is constructing a new asphalt runway facility for scale model aircraft at the Honor Farm site. The construction project is being awarded to Tony J. Beltramo & Sons, Inc.

FINANCIAL IMPLICATIONS:

Funding in the amount of $399,598.90 (contract and contingencies) shall be paid from CI2516, Sky Corral Relocation Project.

BOARD/COMMISSION RECOMMENDATION:

None.

STAKEHOLDER PROCESS:

None.

ALTERNATIVES:

Denial of this Resolution will cancel the project.

RECOMMENDATION:

Approval of the Resolution.

ATTACHMENTS:

1. 26-021 Bid Summary

RESOLUTION NO.

A RESOLUTION AWARDING A CONSTRUCTION CONTRACT IN THE AMOUNT OF $391,098.90 TO TONY J BELTRAMO & SONS, INC., FOR PROJECT NO. 26-021, CONSTRUCT MODEL AIRCRAFT RUNWAY FACILITY, SETTING FORTH $8,500 FOR CONTINGENCIES, AND AUTHORIZING THE PURCHASING AGENT TO EXECUTE SAME

WHEREAS, competitive bids for Account Project No. 26-021 Construct Model Aircraft Runway Facility project have been received and examined; and

WHEREAS, the proposal of Tony J Beltramo & Sons, Inc., was the lowest of those bids determined to be responsive, and the Committee of Awards recommends to the City Council that it authorize Account Project No. 26-021 Construct Model Aircraft Runway Facility project to be performed; NOW THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

The City Council authorizes Account Project No. 26-021 Construct Model Aircraft Runway Facility project, to be performed, and the contract for said project is hereby awarded to Tony J Beltramo & Sons, Inc., in the amount of $391,098.90.

SECTION 2.

The Purchasing Agent is hereby authorized to execute said contract on behalf of the City of Pueblo, a Colorado Municipal Corporation, and the City Clerk shall affix the seal of the City thereto and attest same.

SECTION 3.

In addition to the amount of the bid set forth, as aforementioned, an additional amount as stipulated in this section is hereby established for contingencies and additional work.

Contingencies and Additional Work……$8,500.00

SECTION 4.

Funds for Account Project No. 26-021 in the amount of $399,598.90 shall be from Capital Project No. CI2516 - Sky Corral Relocation Project.

SECTION 5.

The officers of the City are authorized to perform any and all acts consistent with this Ordinance to implement the policies and procedures described herein.

SECTION 6.

This Ordinance shall become effective immediately upon passage and approval.

INTRODUCED: June 8, 2026

BY: _____None_____
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

City of Pueblo
Purchasing
Teresa May Burns, Director
230 S. Mechanic St., Pueblo, CO 81003

EVALUATION TABULATION

IFB No. 26-021

Construct Model Aircraft Runway Facility

RESPONSE DEADLINE: March 18, 2026 at 11:00 am
Report Generated: Wednesday, March 18, 2026

VENDOR TOTALS

Vendor	Base Bid	Bid Alternate No. 1	Bid Alternate No. 2	Total
Tony J Beltramo & Sons, Inc.	$405,352.60	$11,791.90	$35,181.70	$452,326.20
Martin Marietta Materials, Inc.	$439,594.50	$19,877.20	$45,480.85	$504,952.55
Solid Earth Civil Constructors	$496,156.60	$18,055.50	$43,792.50	$558,004.60
United Companies	$497,320.30	$26,605.60	$61,795.75	$585,721.65
Siete, Inc	$580,119.50	$13,557.00	$37,453.00	$631,129.50
Baha Construction, Inc.	$555,352.38	$21,240.00	$58,384.00	$634,976.38
Drengr Solutions LLC	$612,309.30	$17,448.00	$51,936.00	$681,693.30
ROCK M INC	$1,010,914.00	$19,180.00	$57,040.00	$1,087,134.00

BASE BID (Table 1 of 2)

Runway Only

Base Bid					Baha Construction, Inc.		Drengr Solutions LLC		Martin Marietta Materials, Inc.		ROCK M INC		Siete, Inc	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total
X	1	Clear and Grub	8	Acres	$7,200.00	$57,600.00	$4,875.00	$39,000.00	$846.00	$6,768.00	$5,000.00	$40,000.00	$3,500.00	$28,000.00
X	2	Remove Asphalt	6900	SY	$3.00	$20,700.00	$9.75	$67,275.00	$5.30	$36,570.00	$5.00	$34,500.00	$7.00	$48,300.00
X	3	Grading - Cut	20215	CY	$2.90	$58,623.50	$4.10	$82,881.50	$3.20	$64,688.00	$10.00	$202,150.00	$7.50	$151,612.50
X	4	Grading - Fill (CIP)	18058	CY	$2.90	$52,368.20	$4.10	$74,037.80	$2.80	$50,562.40	$18.00	$325,044.00	$3.50	$63,203.00
X	5	Installation and Compaction of 6" Aggregate Base Course (880' x 80')	1868	Tons	$50.37	$94,091.16	$48.00	$89,664.00	$39.70	$74,159.60	$40.00	$74,720.00	$43.00	$80,324.00
X	6	Installation of 3" HMA Pavement (800' x 60') (Grading SX)(75)(PG 64-22)	914	Tons	$187.68	$171,539.52	$204.00	$186,456.00	$137.25	$125,446.50	$250.00	$228,500.00	$120.00	$109,680.00
X	7	Install Silt Fence	1600	LF	$6.90	$11,040.00	$3.25	$5,200.00	$2.80	$4,480.00	$5.00	$8,000.00	$10.00	$16,000.00
X	8	Install Vehicle Tracking Control Pad	1	EA	$38,000.00	$38,000.00	$1,950.00	$1,950.00	$3,450.00	$3,450.00	$4,000.00	$4,000.00	$3,000.00	$3,000.00
X	9	Reestablish Vegetation	6	Acres	$5,000.00	$30,000.00	$4,550.00	$27,300.00	$4,700.00	$28,200.00	$6,500.00	$39,000.00	$3,000.00	$18,000.00
X	10	Mobilization/demobilization	1	LS	$21,390.00	$21,390.00	$38,545.00	$38,545.00	$45,270.00	$45,270.00	$55,000.00	$55,000.00	$62,000.00	$62,000.00
Total						$555,352.38		$612,309.30		$439,594.50		$1,010,914.00		$580,119.50

BASE BID (Table 2 of 2)

Runway Only

Base Bid					Solid Earth Civil Constructors		Tony J Beltramo & Sons, Inc.		United Companies	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total
X	1	Clear and Grub	8	Acres	$5,689.00	$45,512.00	$700.00	$5,600.00	$957.00	$7,656.00
X	2	Remove Asphalt	6900	SY	$3.10	$21,390.00	$2.90	$20,010.00	$3.00	$20,700.00
X	3	Grading - Cut	20215	CY	$2.50	$50,537.50	$3.00	$60,645.00	$4.30	$86,924.50
X	4	Grading - Fill (CIP)	18058	CY	$4.85	$87,581.30	$4.00	$72,232.00	$2.85	$51,465.30
X	5	Installation and Compaction of 6" Aggregate Base Course (880' x 80')	1868	Tons	$34.60	$64,632.80	$52.70	$98,443.60	$61.25	$114,415.00
X	6	Installation of 3" HMA Pavement (800' x 60') (Grading SX)(75)(PG 64-22)	914	Tons	$166.00	$151,724.00	$97.00	$88,658.00	$163.25	$149,210.50
X	7	Install Silt Fence	1600	LF	$4.75	$7,600.00	$3.00	$4,800.00	$2.00	$3,200.00
X	8	Install Vehicle Tracking Control Pad	1	EA	$8,158.00	$8,158.00	$1,500.00	$1,500.00	$3,850.00	$3,850.00
X	9	Reestablish Vegetation	6	Acres	$3,596.00	$21,576.00	$4,369.00	$26,214.00	$816.50	$4,899.00
X	10	Mobilization/demobilization	1	LS	$37,445.00	$37,445.00	$27,250.00	$27,250.00	$55,000.00	$55,000.00
Total						$496,156.60		$405,352.60		$497,320.30

BID ALTERNATE NO. 1 (Table 1 of 2)

Pilot Area

Bid Alternate No. 1					Baha Construction, Inc.		Drengr Solutions LLC		Martin Marietta Materials, Inc.		ROCK M INC		Siete, Inc	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total
X	11	Installation and Compaction of 6" Aggregate Base Course (220' x 20')	117	Tons	$70.00	$8,190.00	$48.00	$5,616.00	$61.50	$7,195.50	$40.00	$4,680.00	$43.00	$5,031.00
X	12	Installation of 3" HMA Pavement (150' x 30') (Grading SX)(75)(PG 64-22)	58	Tons	$225.00	$13,050.00	$204.00	$11,832.00	$218.65	$12,681.70	$250.00	$14,500.00	$147.00	$8,526.00
Total						$21,240.00		$17,448.00		$19,877.20		$19,180.00		$13,557.00

BID ALTERNATE NO. 1 (Table 2 of 2)

Pilot Area

Bid Alternate No. 1					Solid Earth Civil Constructors		Tony J Beltramo & Sons, Inc.		United Companies	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total
X	11	Installation and Compaction of 6" Aggregate Base Course (220' x 20')	117	Tons	$46.50	$5,440.50	$52.70	$6,165.90	$96.70	$11,313.90
X	12	Installation of 3" HMA Pavement (150' x 30') (Grading SX)(75)(PG 64-22)	58	Tons	$217.50	$12,615.00	$97.00	$5,626.00	$263.65	$15,291.70
Total						$18,055.50		$11,791.90		$26,605.60

BID ALTERNATE NO. 2 (Table 1 of 2)

Pit Area

Bid Alternate No. 2					Baha Construction, Inc.		Drengr Solutions LLC		Martin Marietta Materials, Inc.		ROCK M INC		Siete, Inc	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total
X	13	Installation and Compaction of 6" Aggregate Base Course (220' x 60')	351	Tons	$60.00	$21,060.00	$48.00	$16,848.00	$50.95	$17,883.45	$40.00	$14,040.00	$43.00	$15,093.00
X	14	Installation of 3" HMA Pavement (200' x 50') (Grading SX)(75)(PG 64-22)	172	Tons	$217.00	$37,324.00	$204.00	$35,088.00	$160.45	$27,597.40	$250.00	$43,000.00	$130.00	$22,360.00
Total						$58,384.00		$51,936.00		$45,480.85		$57,040.00		$37,453.00

BID ALTERNATE NO. 2 (Table 2 of 2)

Pit Area

Bid Alternate No. 2					Solid Earth Civil Constructors		Tony J Beltramo & Sons, Inc.		United Companies	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Unit Cost	Total	Unit Cost	Total
X	13	Installation and Compaction of 6" Aggregate Base Course (220' x 60')	351	Tons	$39.50	$13,864.50	$52.70	$18,497.70	$68.25	$23,955.75
X	14	Installation of 3" HMA Pavement (200' x 50') (Grading SX)(75)(PG 64-22)	172	Tons	$174.00	$29,928.00	$97.00	$16,684.00	$220.00	$37,840.00
Total						$43,792.50		$35,181.70		$61,795.75

Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Andrew Hayes, Public Works Director

SUBJECT: A RESOLUTION APPROVING AMENDMENT NO. 1 OF THE AGREEMENT FOR PROFESSIONAL SERVICES BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, AND GSG ARCHITECTURE, INC., IN THE AMOUNT OF $30,575 FOR PROJECT NO. 25-059, DESIGN FOR LIMITED REMODEL OF FIRE STATIONS #3 AND #5, AND AUTHORIZING THE PURCHASING AGENT TO EXECUTE SAME

SUMMARY:

This Resolution approves Amendment No. 1 to the Professional Services Agreement awarded to GSG Architecture, Inc., in the amount of $30,575.00 for Project No. 25-059, Design for Limited Remodel for Fire Stations #3 and #5.

PREVIOUS COUNCIL ACTION:

Resolution 16243, dated February 9, 2026, awarded a Professional Services Agreement in the amount of $145,150.00 to GSG Architecture, Inc., for Project No. 25-059, Design for Limited Remodel of Fire Stations #3 and #5.

BACKGROUND:

The City of Pueblo is firmly committed to protecting the health, safety, and comfort of its firefighters through targeted investments to modernize facilities, equipment, and operating practices to reduce occupational hazards and improve operational readiness. As such, a request for proposals for an architect was submitted to renovate Fire Stations #3 and #5. Fire Station #3 renovation includes the existing showers and restrooms. Fire Station #5 renovation includes the separation of the existing living space from the truck bay and creating a workout area.

The Fire Department has requested to increase the scope to Fire Station #3 to develop an alternate design for enclosing part of the truck bay to make a separate living area, enclose an area by the current washer and dryers to make a bunker gear storage room,

demolition/salvage of unused equipment, such as vehicle exhaust extraction systems, and design and a new separate exhaust and make up air system to handle off gassing from the fire suits/equipment storage in the bunker gear room.

The cost of the additional design exceeds the threshold for administrative approval of an amendment.

FINANCIAL IMPLICATIONS:

Funding for Amendment No. 1 ($30,575.00) will be paid from account CI2502, Station Upgrades.

BOARD/COMMISSION RECOMMENDATION:

None.

STAKEHOLDER PROCESS:

None.

ALTERNATIVES:

Denial of this resolution will cancel the additional design.

RECOMMENDATION:

Approval of the Resolution.

ATTACHMENTS:

1. 25-059 GSG Amendment No 1

RESOLUTION NO.

A RESOLUTION APPROVING AMENDMENT NO. 1 OF THE AGREEMENT FOR PROFESSIONAL SERVICES BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, AND GSG ARCHITECTURE, INC., IN THE AMOUNT OF $30,575 FOR PROJECT NO. 25-059, DESIGN FOR LIMITED REMODEL OF FIRE STATIONS #3 AND #5, AND AUTHORIZING THE PURCHASING AGENT TO EXECUTE SAME

WHEREAS, Project No. 25-059, Design for Limited Remodel of Fire Stations #3 and #5 was awarded to GSG Architecture, Inc., on February 23, 2026; and,

WHEREAS, additional scope contemplated by Amendment No. 1 is needed; and,

WHEREAS, it is in the best interest of the City of Pueblo to proceed with the additional scope of work in the manner herein provided; NOW, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

Amendment No. 1, by and between the City of Pueblo, a Municipal Corporation, and GSG Architecture, Inc., a Wyoming Corporation, registered to do business in Colorado, a copy of which is attached hereto, having been approved as to form by the City of Pueblo Attorney, is hereby approved, and City Council authorizes the additional work contemplated by Amendment No. 1 to be performed in the amount of $30,575.00.

SECTION 2.

Funds in the amount of $30,575.00 will be paid from Project CI2502, Station Upgrades.

SECTION 3.

The Purchasing Agent is hereby authorized to execute Amendment No. 1 on behalf of the City of Pueblo, a Colorado Municipal Corporation, and the City Clerk shall affix the seal of the City thereto and attest same.

SECTION 4.

The officers of the City are authorized to perform any and all acts consistent with this Resolution to implement the policies and procedures described herein.

SECTION 5.

This Resolution shall become effective immediately upon passage and approval.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

AMENDMENT NO. 1 TO THE PROFESSIONAL SERVICES AGREEMENT BY AND BETWEEN CITY OF PUEBLO AND GSG ARCHITECTURE, INC.

1. INTRODUCTION

This Amendment No. 1 to the Professional Services Agreement ("Amendment") is executed to be effective as of the _____ day of _____, 20____, by and between the City of Pueblo, a Colorado Municipal Corporation (“City”) and GSG Architecture, Inc., a Wyoming corporation registered to do business in Colorado (“Consultant”). City and Consultant are sometimes referred to herein as a “Party” and collectively, as the “Parties.”

2. PROJECT STATEMENT

WITNESSETH THAT:

WHEREAS, City and Consultant entered into that certain Professional Services Agreement dated February 23, 2026 for Bid 25-059 Design for Limited Remodel of Fire Stations 3 and 5 (the “Agreement”);

WHEREAS, City and Consultant desire to amend the Agreement pursuant to the provisions set forth herein;

NOW, THEREFORE, in consideration of the foregoing premises, the mutual promises set forth herein and other good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, City and Consultant hereby agree to the following conditions.

3. AGREEMENT

A. The Agreement is amended by expanding the scope of services to include the following additional services:

   1. Consultant shall provide schematic design, design development, construction documents, bidding, construction administration, and other related services for additional scope of services at Fire Station #3 remodel as identified in Attachment A.

   2. Attachment A to this Amendment No. 1 shall be additional work as agreed upon by Consultant and City, and Consultant shall complete the work items as generally described in said Attachment A in accordance with the terms of the Agreement.

B. With respect to services provided under the Amendment No. 1, the fee schedule attached as Attachment B to this Amendment No. 1 shall apply to compensation payable to Consultant. The aggregate compensation payable to the Consultant for performance of the additional services authorized by this Amendment No. 1 shall not exceed the maximum amount of $30,575.00 as set forth in the Attachment B and notwithstanding whether the service is billed as Time and Material.

   1. The compensation payable to the Consultant by this Amendment No. 1 shall be billed at the amounts set forth in the Attachment B.

   2. City must respond in writing with written approval prior to Consultant beginning work.

C. City and Consultant shall establish a mutually agreeable work schedule for completion of each major work item. Consultant shall commence and complete all work according to such schedule; however, Consultant will not be responsible for delays beyond Consultant's control.

D. This Amendment shall be binding upon and inure to the benefit of the Parties hereto and their respective successors and assigns.

E. Except as expressly modified by this Amendment No. 1, the Agreement shall remain in full force and effect. Except as modified by this Amendment No. 1, any obligations to be performed under the Agreement by either party are not waived nor excused in any manner but shall be performed in accordance with the terms and conditions of the Agreement as it existed prior to this Amendment No. 1.

F. This Amendment may be executed in one or more counterparts, each of which shall be deemed an original and all of which shall constitute one and the same document with the same effect as if all Parties had signed the same original. The Parties further agree that transmission of this Amendment by any electronic format, telecopy or via email in a PDF format, shall be deemed transmission of the original Amendment for all purposes. Electronic signatures shall be deemed valid and binding to the same extent as the original.

4. SIGNATURE SECTION

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed the day and year first above written.

CITY OF PUEBLO, A MUNICIPAL CORPORATION

By_____
Teresa May Burns, Director of Purchasing

Attest_____
Clyde Bishop, City Clerk

[SEAL]

BALANCE OF APPROPRIATION EXISTS FOR THIS AGREEMENT AND FUNDS ARE AVAILABLE.

_____
Danny Nunn, Director of Finance

SHORT ELLIOTT HENDRICKSON, INC.

By_____

APPROVED AS TO FORM
DEPARTMENT OF LAW

_____
Robert Jagger, Deputy City Attorney

Attachments: Attachments A - B and Additional Information for Amendment

Attachment A

Scope of Services

Excerpt from Consultant Proposal dated April 30, 2026, Page 1

This add service proposal responds to the City of Pueblo's request to provide additional scope for the Fire Station #3 remodel.

This additional scope of work includes:

- Develop an alternate design for enclosing part of the truck bay to make a separate living area for weight training or other miscellaneous functions and enclose an area by the current washer and dryer systems and make a Bunker Gear Storage room.
- Infill one of the large bay doors with appropriate material and one 8’-0” x 8’-0” overhead door.
- Demolition/Salvage of unused equipment within these areas of construction, i.e., vehicle exhaust extraction systems.
- Design a new and separate exhaust and make-up air system to handle any off gassing from the fire suits/equipment stored in the Bunker Gear room.
- Ensure the alternate design does not affect the overall design of the original scope of work so that if the alternate is not completed until a later date, the original scope of work can progress with little to no modifications to the design documents.

General Assumptions:

- Unless specifically noted in this proposal, all previously noted assumptions and exclusions from GSG Architecture’s proposal (dated 11/25/25), and Contract #25-059 between GSG Architecture and the City of Pueblo (fully executed 02/23/26), remain in force.

General Exclusions: *(The following services can be delivered at an additional negotiated fee.)*

- No additional exclusions noted at this time.

Attachment B

Fee Schedule

Excerpt from Consultant Proposal dated April 30, 2026, Page 1

ADD SERIVCES PROSED FEES:

Schematic Design (SD)	$ 5,130
Design Development (DD)	$ 7,730
Construction Documents (CD)	$ 11,080
Bidding	$ 1,975
Construction Administration (CA)	$ 4,660
GRAND TOTAL	**$ 30,575**

Additional Information for Amendment

Certificate of Good Standing – to be added prior to signature

PERA Questionnaire – to be added prior to signature

Insurance Certificate(s) – to be added prior to signature

Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Andra Ahrens, Director Wastewater

SUBJECT: A RESOLUTION RATIFYING AN EMERGENCY CONSTRUCTION CONTRACT IN THE AMOUNT OF $6,831.00 WITH PARKER EXCAVATING, INC., FOR EMERGENCY SANITARY SEWER POINT REPAIR AT 716 MCCULLEY AVE, PROJECT NO. 24-033 (WWAN03) AND APPROVING THE PURCHASING AGENT'S EXECUTION OF THE SAME.

SUMMARY:

This Resolution ratifies and approves award of a construction contract to Parker Excavating, Inc., for emergency sanitary sewer point repairs at 716 McCulley Ave.

PREVIOUS COUNCIL ACTION:

None

BACKGROUND:

While the Wastewater Department collection crew was performing routine cleaning, the cleaning head and approximately 100 feet of hose became stuck in a hole in the pipe and broke off. An emergency point repair was performed to remove the cleaning equipment, so a backup would not occur.

The repair work was performed under the Sanitary Sewer Point Repair multi-year contract under which two contractors were qualified via competitive bid. An estimate was prepared, and Parker Excavating was the lowest bidder and accepted the work.

The cost breakdown for the project is as follows:

Sanitary Sewer Replacement-related		
Total:	$ 6,831.00	100%
Surface Improvement Related		
Total:	$ 0.00	0%
Grand Total:	$ 6,831.00	100%

FINANCIAL IMPLICATIONS:

Funding for this project came from the sanitary sewer rehabilitation budget funded by the Sewer User Fund. Funding was available and had been budgeted, appropriated, and allocated to Project No. 24-033 (WWAN03) – Emergency Point Repair.

BOARD/COMMISSION RECOMMENDATION:

Not Applicable

STAKEHOLDER PROCESS:

None

ALTERNATIVES:

Not approving the Resolution would require a finding that there was not an emergency condition,

RECOMMENDATION:

Approval of the Resolution

ATTACHMENTS:

1. 6-8-26 716 McCulley Ave Emergency Point Repair Attachment

RESOLUTION NO.

A RESOLUTION RATIFYING AN EMERGENCY CONSTRUCTION CONTRACT IN THE AMOUNT OF $6,831.00 WITH PARKER EXCAVATING, INC., FOR EMERGENCY SANITARY SEWER POINT REPAIR AT 716 MCCULLEY AVE, PROJECT NO. 24-033 (WWAN03) AND APPROVING THE PURCHASING AGENT'S EXECUTION OF THE SAME.

WHEREAS, an emergency sanitary sewer repair was authorized by the Mayor in accordance with Section 1-10-5 of the Pueblo Municipal Code; and

WHEREAS, the point repair work was awarded to Parker Excavating, Inc., under the 2024-2026 multi-year point repair contract; NOW, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

City Council ratifies and approves the contract for repair of the sanitary sewers at 716 McCulley Ave. with Parker Excavating, Inc., Project No. 24-033 (WWAN03) — Emergency Point Repair awarded to said bidder in the total amount of $6,831.00 including contract change order.

SECTION 2.

Funds for Project 24-033 (WWAN03) — Emergency Point Repair shall be from the Sewer User Fund.

SECTION 3.

The Purchasing Agent was authorized to execute said contract on behalf of Pueblo, a Colorado Municipal Corporation, and the City Clerk properly affixed the seal of the City thereto and attested the same.

SECTION 4.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Resolution and the contract to implement the transactions described therein. Furthermore, all actions previously taken by officers and staff of the City consistent with the contract, including a contract change order in the amount of $4,706.00 and any other payment authorized under the contract are hereby ratified.

SECTION 5.

This Resolution shall become effective immediately upon passage and approval.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

2024-2026 Emergency Sanitary Sewer Point Repair					716 McCulley Ave	
Date 4/8/2025						
Project Number: 24-033 (WWAN03)					Parker Excavating, Inc.	
Item	**Description**	**Estimated**			**Unit Price**	
1	Remove and Replace 8” PVC Less than 10’ Deep	1-20	LF		150.00	$ -
		21-100	LF		138.00	$ -
		>100	LF		113.00	$ -
2	Remove and Replace 8” PVC More than 10’ Deep	1-20	LF		158.00	$ -
		21-100	LF		146.00	$ -
		>100	LF		121.00	$ -
3	Remove and Replace 10” PVC Less than 10’ Deep	1-20	LF		170.00	$ -
		21-100	LF		142.00	$ -
		>100	LF		138.00	$ -
4	Remove and Replace 10” PVC More than 10’ Deep	1-20	LF		183.00	$ -
		21-100	LF		153.00	$ -
		>100	LF		149.00	$ -
5	Remove and Replace 12” PVC Less than 10’ Deep	1-20	LF		189.00	$ -
		21-100	LF		155.00	$ -
		>100	LF		153.00	$ -
6	Remove and Replace 12” PVC More than 10’ Deep	1-20	LF		204.00	$ -
		21-100	LF		167.00	$ -
		>100	LF		165.00	$ -
7	Remove and Replace 15” PVC Less than 10’ Deep	1-20	LF		167.00	$ -
		21-100	LF		153.00	$ -
		>100	LF		151.00	$ -
8	Remove and Replace 15” PVC More than 10’ Deep	1-20	LF		182.00	$ -
		21-100	LF		171.00	$ -
		>100	LF		167.00	$ -
9	Remove and Replace 4” Service Tap Less than 10’ Deep	1-20	LF		129.00	$ -
		21-100	LF		107.00	$ -
		>100	LF		102.00	$ -
10	Remove and Replace 4” Service Tap More than 10’ Deep	1-20	LF		143.00	$ -
		21-100	LF		114.00	$ -
		>100	LF		108.00	$ -
11	Remove and Replace 6” Service Tap Less than 10’ Deep	1-20	LF		154.00	$ -
		21-100	LF		128.00	$ -
		>100	LF		122.00	$ -
12	Remove and Replace 6” Service Tap More than 10’ Deep	1-20	LF		166.00	$ -
		21-100	LF		138.00	$ -
		>100	LF		132.00	$ -
13	Asphalt Patch – 4” HMA on 4” Class 6 ABC For 8" and 10" Pipe	1-20	LF		102.00	$ -
		21-100	LF		78.00	$ -
		>100	LF		75.00	$ -
14	Asphalt Patch – 5” HMA on 6” Class 6 ABC For 8” and 10” Pipe	1-20	LF		104.00	$ -
		21-100	LF		79.00	$ -
		>100	LF		77.00	$ -
15	Asphalt Patch – 4” HMA on 4” Class 6 ABC For 12" and 15" Pipe	1-20	LF		105.00	$ -
		21-100	LF		81.00	$ -
		>100	LF		79.00	$ -
16	Asphalt Patch – 5” HMA on 6” Class 6 ABC For 12" and 15" Pipe	1-20	LF		112.00	$ -
		21-100	LF		86.00	$ -
		>100	LF		85.00	$ -
17	Remove and Replace 7” Reinforced Concrete	1-20	SF		24.50	$ -
		21-100	SF		19.50	$ -
		>100	SF		18.50	$ -
18	Remove and Replace 6” Reinforced Concrete	1-20	SF		24.00	$ -
		21-100	SF		19.00	$ -
		>100	SF		18.00	$ -
19	Remove and Replace 4” Concrete	1-20	SF		19.00	$ -
		21-100	SF		16.50	$ -
		>100	SF		16.00	$ -
20	Remove and Replace Standard Curb and Gutter	1-20	LF		51.00	$ -
		21-100	LF		49.50	$ -
		>100	LF		48.00	$ -

21	Install or Remove and Replace 6'' Curb Head	1-20	LF		31.00	$	-
		21-100	LF		29.00	$	-
		>100	LF		28.00	$	-
22	Install Extra Lean Concrete (FlowFill)	1-20	CY		164.00	$	-
		21-100	CY		164.00	$	-
		>100	CY		164.00	$	-
23	Class 6 Base Course for Gravel Surfaced Alleys	TN			33.00	$	-
24	Remove Camera/Cleaning Head/Tap Cutter	HR		1	400.00	$	400.00
25	Remove and Replace 48” Diameter Manhole	with 1 Invert	EA		4280.00	$	-
		with 2 Inverts	EA		5300.00	$	-
		with 3 Inverts	EA		6340.00	$	-
		with 4 Inverts	EA		7380.00	$	-
26	Remove and Replace 60” Diameter Manhole	with 1 Invert	EA		5130.00	$	-
		with 2 Inverts	EA		6170.00	$	-
		with 3 Inverts	EA		7210.00	$	-
		with 4 Inverts	EA		8250.00	$	-
27	Calcium Aluminate Coat 48-inch Manhole	1-10	VF		375.00	$	-
		11-15	VF		350.00	$	-
		>15	VF		325.00	$	-
28	Calcium Aluminate Coat 60-inch Manhole	1-10	VF		468.75	$	-
		11-15	VF		437.50	$	-
		>15	VF		406.25	$	-
29	Rebuild Manhole Bench and Trough 48-inch Manhole	LS			2000.00	$	-
30	Rebuild Manhole Bench and Trough 60-inch Manhole	LS			2500.00	$	-
31	Reinstate Services - 4''	EA			388.00	$	-
32	Reinstate Services - 6''	EA			427.00	$	-
33	Mobilization	LS		1	1725.00	$	1,725.00
				Total		$	2,125.00
				With Contingency	$ -	$	2,550.00

CONTRACT CHANGE ORDER

CITY OF PUEBLO DEPARTMENT OF PUBLIC WORKS

Project Number : 24-033 (WWAN03) Change Order No. : ONE 4/30/2026

Project Name : 2024, 2025 and 2026 Sanitary Sewer Point Repair
716 McCulley Ave

Contractor : PARKER EXCAVATING, INC.
1428 Stockyard Road, Pueblo, CO, 81001

You are hereby requested to comply with the following changes from the plans & specifications:

Bid Item No.	Description of Changes	Decrease Contract By	Increase Contract By
1	REMOVE CAMERA/CLEANING HEAD/TAP CUTTER		$2,800.00
3	REMOVE AND REPLACE 4" PIPE		$1,290.00
4	REMOVE AND REPLACE 6" PIPE		$616.00
	TOTAL (Decrease) / Increase	$0.00	$4,706.00

Net Adjustment This Change Order	$	4,706.00
Amount of Previous Change Order(s)	$	0.00
Original Contract Amount	$	2,125.00
Total Adjusted Contract Amount To Date	$	6,831.00

Reason For Change: Actual Field Quantities.

The time provided for completion of the contract is changed by 0 calendar days.
This document shall become an amendment to the contract and all provisions of the contract apply hereto.

Prepared by: _____ Date:_____
Wastewater Civil Engineer

Reviewed by: _____ Date:_____
Wastewater Engineering Manager

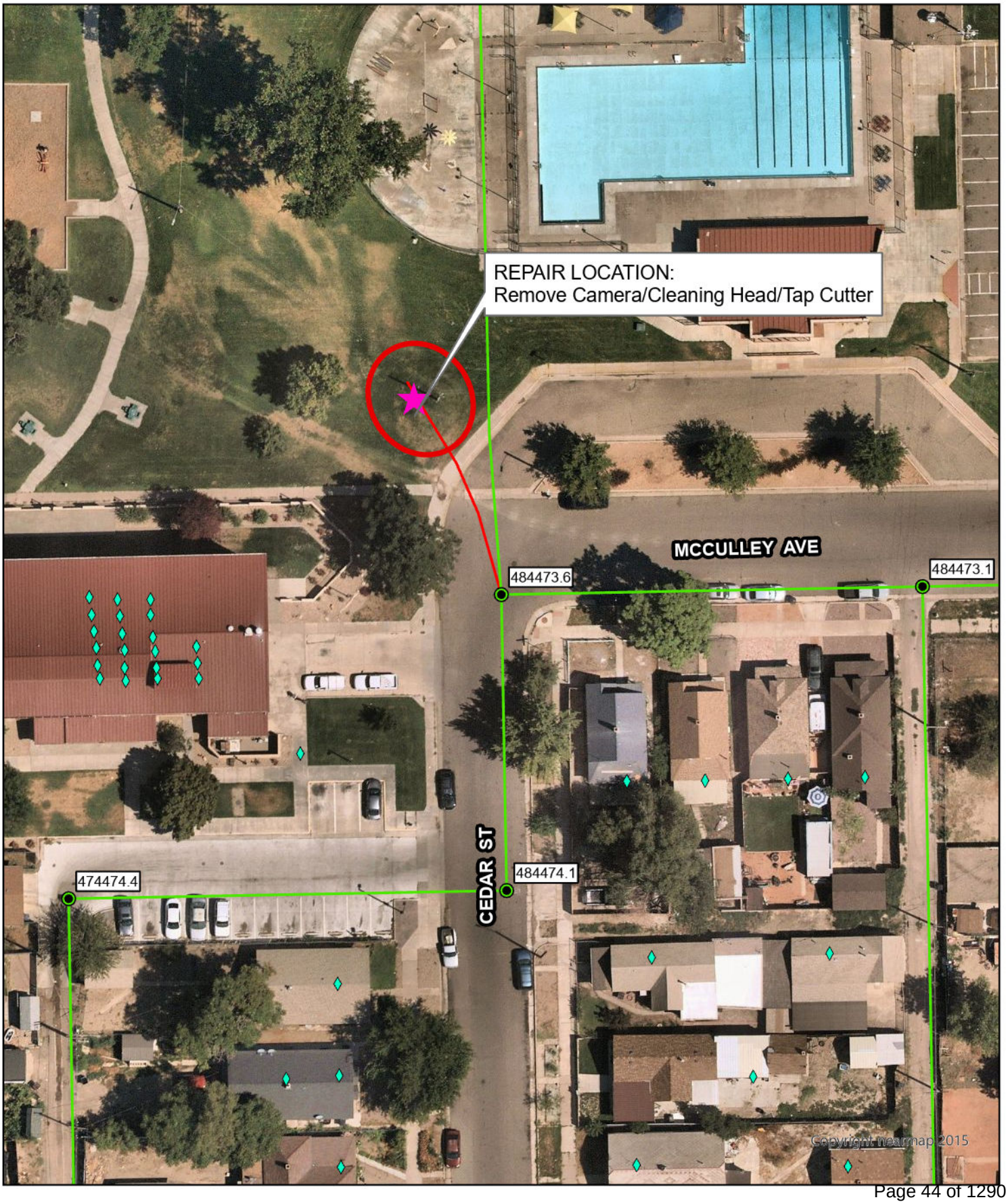
Accepted by: _____ Date:_____
Contractor's Representative

If this Change Order causes an increase from the original contract price, signed approval by the Director constitutes representation that lawful appropriations are sufficient to cover such increase.

Approved by: _____ Date:_____
Director of Wastewater

FORM CO100.1299

24-033 (WWAN03)
2024 -2026 Emergency Sanitary Point Repair
716 McCulley Ave



Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Andrew Hayes, Public Works Director

SUBJECT: A RESOLUTION AUTHORIZING THE ISSUANCE OF REVOCABLE PERMIT (REV-26-15) TO THE DIOCESE OF PUEBLO FOR THE USE OF THE PUBLIC RIGHT-OF-WAY ALONG THE 400 BLOCK OF CLARK STREET ON THE WEST SIDE AND THE 800 BLOCK OF EAST "B" STREET ON THE NORTH SIDE FOR THE PURPOSE OF HOSTING OUR LADY OF MOUNT CARMEL'S ANNUAL FESTIVAL AND PROCESSION

SUMMARY:

Attached is a Resolution authorizing the issuance of a Revocable Permit (REV-26-15) to the Diocese of Pueblo for the use of the public right-of-way along the 400 block of Clark Street on the west side and the 800 block of East "B" Street on the north side for the purpose of hosting Our Lady of Mount Carmel's Annual Festival and Procession.

PREVIOUS COUNCIL ACTION:

None.

BACKGROUND:

The Diocese of Pueblo has submitted a Revocable Permit (REV-26-15) to the Diocese of Pueblo for the use of the public right-of-way along the 400 block of Clark Street on the west side and the 800 block of East "B" Street on the north side for the purpose of hosting Our Lady of Mount Carmel's Annual Festival and Procession from July 11, 2026, at 5:30 p.m., through July 12, 2026, at 10:00 p.m.

FINANCIAL IMPLICATIONS:

None.

BOARD/COMMISSION RECOMMENDATION:

The Revocable Permit Review Committee recommends approval.

STAKEHOLDER PROCESS:

None.

ALTERNATIVES:

Failure to approve the Resolution will prevent the applicant from hosting Our Lady of Mount Carmel's Annual Festival and Procession.

RECOMMENDATION:

Approval of the Resolution.

ATTACHMENTS:

1. NOTARIZED REVOCABLE PERMIT - 26-15

RESOLUTION NO.

A RESOLUTION AUTHORIZING THE ISSUANCE OF REVOCABLE PERMIT (REV-26-15) TO THE DIOCESE OF PUEBLO FOR THE USE OF THE PUBLIC RIGHT-OF-WAY ALONG THE 400 BLOCK OF CLARK STREET ON THE WEST SIDE AND THE 800 BLOCK OF EAST "B" STREET ON THE NORTH SIDE FOR THE PURPOSE OF HOSTING OUR LADY OF MOUNT CARMEL'S ANNUAL FESTIVAL AND PROCESSION

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

The attached Revocable Permit (REV-26-15) to the Diocese of Pueblo for the use of the public right-of-way along the 400 block of Clark Street on the west side and the 800 block of East "B" Street on the north side for the purpose of hosting Our Lady of Mount Carmel's Annual Festival and Procession from July 11, 2026, at 5:30 p.m., through July 12, 2026, at 10:00 p.m.

SECTION 2.

The use of the public right-of-way granted hereby is subject to all limitations, terms, and conditions set forth in the attached Revocable Permit.

SECTION 3.

The Officers of the City are authorized to perform any and all acts consistent with the intent of this Resolution to implement the policies and procedures described herein.

SECTION 4.

This Resolution shall become effective immediately upon passage and approval.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

REVOCABLE PERMIT

Pursuant to the authority granted by Section 16-9 of the Charter of Pueblo, a Municipal Corporation, (the "City"), the City Council of City hereby grants the following revocable permit to Permittee subject to and conditioned upon the provisions herein contained and the Permittee's compliance therewith:

1. Name, Address and Telephone Number of Permittee: **Diocese of Pueblo 101 N. Greenwood, Pueblo, CO 81003 (719) 544-9861 101 N. Greenwood Street**
2. Permitted Area: **The 400 block of Clark Street on the west side and the 800 block of East "B" Street on the north side**
3. Purpose of Revocable Permit: **Closure of the roadway to vehicular traffic to host Our Lady of Mount Carmel festival and procession**
4. Commencement Date: **July 11, 2026** Time: **5:30 p.m.**
5. Ending Date: **July 12, 2026** Time: **10:00 p.m.**

PERMITTEE IN CONSIDERATION OF THE ISSUANCE AND GRANTING OF THE ABOVE DESCRIBED REVOCABLE PERMIT (THE "PERMIT") REPRESENTS, WARRANTS AND AGREES:

(a) The Permitted Area shall be used for the above-specified Purpose of Revocable Permit. No use of the Permitted Area shall be made before the time of the Commencement Date.

(b) All structures, fences, tables, chairs, equipment or other improvements authorized to be placed in the Permitted Area by Permittee (the "Improvements") shall be constructed, installed, and maintained by Permittee in compliance with all applicable codes, ordinances, rules and regulations of City and this Permit.

(c) If the Revocable Permit is issued for a sidewalk café, the Permittee and sidewalk café shall be subject to all the provisions, conditions and requirements contained in section 9-10-84 of the Pueblo Municipal Code, or as same may be amended, which are incorporated herein by reference. In addition, no Improvement shall be tied-down or chained to any tree within or adjacent to the Permitted Area nor shall any Improvement be installed or located in such a manner as to hinder or interfere with the opening of motor vehicle doors or passenger movement to and from motor vehicles parked adjacent to or near the Permitted Area.

(d) If this Permit is issued for the use of the public right-of-way for a special event, Permittee shall deposit with the City the sum of $500.00 ("Deposit"). The Deposit will be forfeited to the City if Permittee does not remove all Permittee's equipment and property from, and clean and restore the Permitted Area to its original condition before the Time of the Ending Date. If so timely removed and cleaned, the Deposit will be returned to Permittee.

(e) Before the Time of the Ending Date, or immediately upon any other termination of this Permit, Permittee shall, at Permittee's expense, remove all of Permittee's Improvements from the Permitted Area and clean and restore the Permitted Area to its original condition. Failure to timely remove all of Permittee's Improvements from the Permitted Area and clean and restore the Permitted Area to its original condition shall constitute Permittee's abandonment of the Permittee's Improvements, and City may, at Permittee's expense, remove and dispose of Permittee's Improvements and clean and restore the Permitted Area to its original condition. Permittee agrees to pay all City's costs and expenses, including reasonable attorney fees, incurred in the enforcement of this Permit.

(f) Permittee shall keep all Improvements and Permitted Area in good, clean and safe condition and repair, free from litter, waste and debris.

(g) Permittee shall indemnify, defend and hold City, its officers, agents and employees harmless from and against any and all suits, claims, liabilities, loss, damages and expenses, including reasonable attorney fees and cost of defense, arising, directly or indirectly, from or caused by the issuance of this Permit or the conditions hereof, or the existence, construction, installation, repair or maintenance of the Improvements in the Permitted Area, or the use of the Permitted Area or Improvements by Permittee, its officers, agents, employees, invitees or general public.

(h) Neither this Permit nor any of the privileges granted to Permittee hereby, may be conveyed, assigned, transferred or sublet by Permittee without the prior written consent of the City Council of City. Any attempted conveyance, assignment, transfer or subletting of the Permit or Permitted Area without the written consent of the City Council of Pueblo shall be void and of no effect and shall cause this Permit to be automatically revoked.

(i) Permittee shall keep and maintain commercial general liability insurance covering the Permitted Area and Improvements in amounts not less than $1,000,000.00 combined single limits per occurrence and aggregate, naming the City as an additional insured and contain a waiver of rights of subrogation against City. A certificate for such insurance and each renewal thereof shall be delivered to the City. Failure to maintain such insurance shall cause this Permit to be automatically revoked.

(j) Trees, landscaping and shrubbery within or adjacent to the Permitted Area shall be protected from damage or injury by Permittee and shall not be removed except after receipt by the Permittee of the written consent of the City's Director of Parks and Recreation. Covid-19

(k) Any notice or other document required or permitted herein shall be in writing and delivered personally or by first class mail, postage prepaid, as follows:

(i) If to Permittee, at the address shown in paragraph 1 above.

(ii) If to City, 1 City Hall Place, Pueblo, Colorado, 81003, Attention: Revocable Permit Review Committee. Each party reserves the right to change its address provided notice of such change is given in accordance with this paragraph (k).

(l) City reserves and is hereby granted by Permittee access to, under and through the Permitted Area for any and all purposes. City may injure, damage or remove any and all Permittee's Improvements in the Permitted Area in exercising the right of access hereby reserved and granted. Permittee assumes the risk of injury, loss and damage to Permittee's Improvements within the Permitted area, and City shall have no responsibility or liability for any damage or injuries thereto, whatsoever the cause, including, but not limited to, the acts or omissions of City, its officers, employees, or agents.

(m) This Permit shall terminate upon the occurrence of any one of the following events: (i) the Time of the Ending Date, (ii) abandonment or nonuse by Permittee for a period of three (3) consecutive months, (iii) surrender or cancellation of the Permit in writing by Permittee, (iv) automatic revocation as provided in paragraphs (h) and (i) above; (v) revocation or termination of this Permit by resolution of the City Council of City; or (vi) revocation by the Mayor as provided in paragraph (p). The termination of this Permit shall not relieve Permittee from Permittee's obligations under paragraph (f) until the Authorized Improvements have been removed by Permittee in compliance with paragraph (e).

(n) Permittee acknowledges and agrees that this Permit is temporary and subject to revocation or termination by resolution of the City Council of City, in its sole discretion, for any reason or no reason, at anytime, without liability to City, and without notice to or hearing by Permittee. Permittee waives any and all right or claim to such notice, hearing, and liability of the City.

(o) Permittee acknowledges and agree that use of the Permitted Area shall be conducted in compliance with applicable laws and regulations including but not limited orders, regulations and directives issued by the Governor, Colorado Department of Public Health and Environment and the Pueblo County Department of Public Health and Environment with respect to COVID-19 ("COVID-19 Regulations"). Seven days prior to Commencement Date, Permittee shall submit in writing to the Revocable Permit Review Committee those actions Permittee shall take to assure protection of the public health and compliance with COVID-19 Regulations.

(p) Permittee further acknowledges and agrees that this Permit is temporary and subject to revocation or termination if the purpose of the permit or any potential activities to be conducted under the Permit is determined by the Mayor of City, in his sole and absolute discretion, to not be in furtherance of and/or contrary to the public health or welfare due to COVID-19 or related issues. Such determination and termination may be issued at any time, without liability to City, and without notice to or hearing by Permittee. Permittee waives any and all right or claim to such notice, hearing, and liability of the City.

(q) Nothing in this Permit shall be interpreted to limit or prevent the protections afforded to City under the Colorado Governmental Immunity Act, C.R.S. § 24-10-101, et seq.

Signed in Pueblo, Colorado this 28 day of May, 2026.

PERMITTEE:
Organization or Individual: Ronald S. Martinez Sr.
By: Ronald S. Martinez Sr.
Title: Event coordinator

STATE OF COLORADO)

COUNTY OF PUEBLO) SS..

The foregoing instrument was acknowledged before me the 28th day of May, 2026 by Ronald S Martinez, Sr as Event Coordinator.

My commission expires: _____.

TACY SUZETTE BARRY
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20234007982
MY COMMISSION EXPIRES 02/28/2027

Notary Public

APPROVED this _____ day of _____, 20____.
PUEBLO, a Municipal Corporation

By _____

Heather Graham, Mayor

Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Alyssa Parga, Executive Assistant to the Mayor

SUBJECT: A RESOLUTION CONFIRMING THE REAPPOINTMENT BY THE MAYOR OF YVONNE LUJAN-SLAK TO SERVE A FOUR-YEAR TERM EXPIRING JUNE 30, 2030, ON THE ZONING BOARD OF APPEALS

SUMMARY:

This Resolution confirms the reappointment by the Mayor of Yvonne Lujan-Slak to serve a four-year term expiring June 30, 2030, on the Zoning Board of Appeals.

PREVIOUS COUNCIL ACTION:

The Mayor has made appointments to boards and commissions selecting individuals to serve terms which expire during a particular calendar year and presented them to Council for approval.

BACKGROUND:

Due to the term expiration of Yvonne Lujan-Slak, there is one position available to serve a four-year term expiring June 30, 2030, on the Zoning Board of Appeals.

Ms. Lujan-Slak is term-limited and has not sat out the full term as required per Reso 13614, Section 3, “After serving two consecutive terms, an incumbent applicant may not serve again on the same board or commission until a subsequent full term has transpired, unless the Mayor determines that there are no new applicants who are suitable and qualified.” However, the final statement would allow the Mayor to appoint Ms. Lujan-Slak if deemed necessary.

Ms. Lujan-Slak was the only applicant for this position.

FINANCIAL IMPLICATIONS:

Zoning Board of Appeals members receive as compensation $25.00 for each regular or special meeting attended. The Chairman of the Board receives an additional sum of

25.00 per month for each month of service as Chairman. These monies are allocated in the Planning and Community Development's annual budget.

BOARD/COMMISSION RECOMMENDATION:

N/A

STAKEHOLDER PROCESS:

N/A

ALTERNATIVES:

Remove from the agenda and re-advertise for additional applications. This would result in a vacancy on the Zoning Board of Appeals until the position is filled.

RECOMMENDATION:

Approval of the Resolution.

ATTACHMENTS:

None

RESOLUTION NO.

A RESOLUTION CONFIRMING THE REAPPOINTMENT BY THE MAYOR OF YVONNE LUJAN-SLAK TO SERVE A FOUR-YEAR TERM EXPIRING JUNE 30, 2030, ON THE ZONING BOARD OF APPEALS

WHEREAS, Mayor Heather Graham has requested confirmation by the City Council of her reappointment of Yvonne Lujan-Slak to the Zoning Board of Appeals; NOW, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

The appointment by the Mayor of Yvonne Lujan-Slak to the Zoning Board of Appeals to serve a three-year term expiring June 30, 2030 shall be and is hereby confirmed by the City Council.

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with this Resolution to implement the appointments described herein.

SECTION 3.

This Resolution shall become effective on the date of final action by the Mayor and City Council.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Alyssa Parga, Executive Assistant to the Mayor

SUBJECT: A RESOLUTION CONFIRMING THE REAPPOINTMENT BY THE MAYOR OF PHYLLIS SANCHEZ TO SERVE A FIVE-YEAR TERM EXPIRING JULY 1, 2031, ON THE HOUSING AUTHORITY OF THE CITY OF PUEBLO BOARD OF DIRECTORS

SUMMARY:

This Resolution confirms the reappointment by the Mayor of Phyllis Sanchez to serve a five-year term expiring July 1, 2031, on the Housing Authority of the City of Pueblo Board of Directors.

PREVIOUS COUNCIL ACTION:

The Mayor has made appointments to boards and commissions selecting individuals to serve terms which expire during a particular calendar year and presented them to Council for approval.

BACKGROUND:

Due to the term expiration of Phyllis Sanchez, there is one position available to serve a five-year term on this board. Ms. Sanchez is eligible to serve another term.

FINANCIAL IMPLICATIONS:

This is a volunteer committee and members serve without compensation.

BOARD/COMMISSION RECOMMENDATION:

N/A

STAKEHOLDER PROCESS:

N/A

ALTERNATIVES:

Remove from the agenda and re-advertise for additional applications.

RECOMMENDATION:

Approval of the Resolution.

ATTACHMENTS:

None

RESOLUTION NO.

A RESOLUTION CONFIRMING THE REAPPOINTMENT BY THE MAYOR OF PHYLLIS SANCHEZ TO SERVE A FIVE-YEAR TERM EXPIRING JULY 1, 2031, ON THE HOUSING AUTHORITY OF THE CITY OF PUEBLO BOARD OF DIRECTORS

WHEREAS, Mayor Heather Graham has requested confirmation by the City Council of her reappointment of Phyllis Sanchez to the Housing Authority of the City of Pueblo Board of Directors; NOW, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

The appointment by the Mayor of Phyllis Sanchez to the Housing Authority of the City of Pueblo Board of Directors to serve a five-year term expiring July 1, 2031, shall be and is hereby confirmed by the City Council.

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with this Resolution to implement the appointments described herein.

SECTION 3.

This Resolution shall become effective on the date of final action by the Mayor and City Council.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Alyssa Parga, Executive Assistant to the Mayor

SUBJECT: A RESOLUTION CONFIRMING THE REAPPOINTMENT OF CHERYL SPINUZZI AND THE APPOINTMENT OF JANE CAWLFIELD TO SERVE A FOUR-YEAR TERM EXPIRING JULY 1, 2030, ON THE PLANNING & ZONING COMMISSION

SUMMARY:

This Resolution confirms the appointment by the Mayor of Cheryl Spinuzzi and Jane Cawlfield to serve a four-year term expiring July 1, 2030, on the Planning & Zoning Commission.

PREVIOUS COUNCIL ACTION:

The Mayor has made appointments to boards and commissions selecting individuals to serve terms which expire during a particular calendar year and presented them to Council for approval.

BACKGROUND:

Due to the term expiration of Patrick Avalos and Cheryl Spinuzzi, there are two appointments available to serve a four-year term on the Planning & Zoning Commission. Mr. Avalos has reached his term limit. Ms. Spinuzzi has not.

FINANCIAL IMPLICATIONS:

Planning and Zoning Commission Members receive as compensation $25.00 for each regular or special meeting attended. The Chairman of the Board receives as additional compensation the sum of $25.00 per month for each month of service as Chairman. These monies are allocated in the Planning and Community Development's annual budget.

BOARD/COMMISSION RECOMMENDATION:

N/A

STAKEHOLDER PROCESS:

N/A

ALTERNATIVES:

Remove from the agenda and re-advertise for additional applications. This would result in vacancies on the Planning and Zoning Commission until the position is filled.

RECOMMENDATION:

Approval of the Resolution.

ATTACHMENTS:

None

RESOLUTION NO.

A RESOLUTION CONFIRMING THE REAPPOINTMENT OF CHERYL SPINUZZI AND THE APPOINTMENT OF JANE CAWLFIELD TO SERVE A FOUR-YEAR TERM EXPIRING JULY 1, 2030, ON THE PLANNING & ZONING COMMISSION

WHEREAS, Mayor Heather Graham has requested confirmation by the City Council of her reappointment of Cheryl Spinuzzi and appointment of Jane Cawlfield to the Planning & Zoning Commission; NOW, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

The reappointment by the Mayor of Cheryl Spinuzzi and appointment of Jane Cawlfield to the Planning & Zoning Commission to serve a four-year term expiring July 1, 2030 shall be and is hereby confirmed by the City Council.

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with this Resolution to implement the appointments described herein.

SECTION 3.

This Resolution shall become effective on the date of final action by the Mayor and City Council.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Alyssa Parga, Executive Assistant to the Mayor

SUBJECT: A RESOLUTION CONFIRMING THE APPOINTMENT BY THE MAYOR OF ANTHONY GARCIA AND CICI SPARKMAN TO COMPLETE A FOUR-YEAR TERM EXPIRING AUGUST 30, 2029, ON THE ADA ADVISORY COMMITTEE

SUMMARY:

This Resolution confirms the appointment by the Mayor of Anthony Garcia and CiCi Sparkman to complete a four-year term expiring August 30, 2029, on the ADA Advisory Committee.

PREVIOUS COUNCIL ACTION:

The Mayor has made appointments to boards and commissions selecting individuals to serve terms which expire during a particular calendar year and presented them to Council for approval.

BACKGROUND:

Since the committee composition of up to 15 members, there are positions available to serve a four-year term expiring August 30, 2029 on the ADA Advisory Committee.

FINANCIAL IMPLICATIONS:

This is a volunteer committee and members serve without compensation.

BOARD/COMMISSION RECOMMENDATION:

Approval of the Resolution.

STAKEHOLDER PROCESS:

N/A

ALTERNATIVES:

N/A

RECOMMENDATION:

Approval of the Resolution.

ATTACHMENTS:

None

RESOLUTION NO.

A RESOLUTION CONFIRMING THE APPOINTMENT BY THE MAYOR OF ANTHONY GARCIA AND CICI SPARKMAN TO COMPLETE A FOUR-YEAR TERM EXPIRING AUGUST 30, 2029, ON THE ADA ADVISORY COMMITTEE

WHEREAS, Mayor Heather Graham has requested confirmation by the City Council of her appointment of Anthony Garcia and CiCi Sparkman to the ADA Advisory Committee; NOW, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

The appointment by the Mayor of Anthony Garcia and CiCi Sparkman to the ADA Advisory Committee to complete a four-year term expiring August 30, 2029, shall be and is hereby confirmed by the City Council.

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with this Resolution to implement the appointments described herein.

SECTION 3.

This Resolution shall become effective on the date of final action by the Mayor and City Council.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Harley Gifford, Deputy City Attorney

SUBJECT: AN ORDINANCE AMENDING TITLE IV OF THE PUEBLO MUNICIPAL CODE BY CREATING A NEW CHAPTER 12 RELATING TO ENERGY CODE; ADOPTING BY REFERENCE THE COLORADO MODEL ELECTRIC READY AND SOLAR READY CODE; AMENDING SECTION 4-1-2 OF THE PUEBLO MUNICIPAL CODE TO ADD THE COLORADO MODEL ELECTRIC READY AND SOLAR READY CODE TO THE LIST OF MINOR OR SECONDARY CODES; AND PROVIDING PENALTIES AND REMEDIES FOR THE VIOLATION THEREOF

SUMMARY:

Attached is an Ordinance amending Title IV of the Pueblo Municipal Code by creating a new Chapter 12 relating to Energy Code, and adopting by reference the Colorado Model Electric Ready and Solar Ready Code. Section 109 (Board of Appeals) of the Colorado Model Electric Ready and Solar Ready Code is not adopted and is expressly deleted, with appeals to be heard by the Building Board of Appeal in accordance with Sections 15(d) and 18 of the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department. The Ordinance also amends Section 4-1-2 of the Pueblo Municipal Code to add the Colorado Model Electric Ready and Solar Ready Code to the list of minor or secondary codes.

This Ordinance is the first of two related Ordinances. A companion Ordinance, to be introduced separately, will repeal the existing local amendments to the 2021 International Energy Conservation Code under Ordinance No. 10466 (May 22, 2023) and re-adopt that code in the new Chapter 12 of Title IV. Adoption of both Ordinances brings the City into compliance with the energy code mandate at C.R.S. § 31-15-602(3.5)(a), which requires municipalities updating any building code between July 1, 2023 and June 30, 2026 to adopt an energy code achieving equivalent or better performance than both the 2021 International Energy Conservation Code and the model electric ready and solar ready code language adopted by the Colorado Energy

Code Board.

PREVIOUS COUNCIL ACTION:

None. The City has not previously adopted the Colorado Model Electric Ready and Solar Ready Code or any predecessor model electric ready or solar ready code.

BACKGROUND:

In 2022, the Colorado General Assembly enacted House Bill 22-1362, codified in part at C.R.S. § 31-15-602(3.5)(a), directing municipalities and counties that update any building code between July 1, 2023 and June 30, 2026 to adopt an energy code achieving equivalent or better energy performance than the 2021 International Energy Conservation Code and the model electric ready and solar ready code language adopted by the Colorado Energy Code Board. The Energy Code Board, established under C.R.S. § 24-38.5-401, adopted the Colorado Model Electric Ready and Solar Ready Code, version 1.0, which the Colorado Energy Office published on June 1, 2023.

The City has not previously adopted the Colorado Model Electric Ready and Solar Ready Code. Adoption of the Model Code by this Ordinance, paired with re-adoption of the 2021 International Energy Conservation Code under the companion Ordinance to be introduced separately, brings the City into compliance with the dual performance requirement of C.R.S. § 31-15-602(3.5)(a). New Section 4-12-3 of the Pueblo Municipal Code adopts the Model Code with three administrative amendments necessary for jurisdiction-specific application: (i) deletion of Section 109 (Board of Appeals), with appeals to the Building Board of Appeal under Sections 15(d) and 18 of the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department; (ii) specification of “City of Pueblo, Colorado” as the jurisdiction name in Section 101.1, and designation of the Building Board of Appeal as the entity authorized to grant waivers under Sections 102.1.2 and 102.2; and (iii) reference to Section 4-12-4 of this Code as the source of fines under Section 108.4. None of these administrative amendments affect the energy performance of the Model Code as adopted, and the Ordinance therefore satisfies the equivalent-or-better-performance standard at C.R.S. § 31-15-602(3.5)(a) with respect to the Model Code component of the dual performance requirement.

The Ordinance follows the procedures for adoption of codes by reference set forth at C.R.S. §§ 31-16-201 through 31-16-208 (“Part 2”), including the dual mayor-and-clerk certification of code copies under C.R.S. § 31-16-206 and the two-publication notice rule under C.R.S. § 31-16-203. The penalty provisions for violation of the Model Code are set forth in full in new Section 4-12-4 of the Pueblo Municipal Code, as required by C.R.S. § 31-16-204.

The new Chapter 12 of Title IV of the Pueblo Municipal Code will be enforced by the Southern Colorado Building Department under the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department, consistent with the Department’s authority to enforce all building codes adopted by the City as set forth in Section 4-1-2 of the Pueblo Municipal Code as amended by Ordinance No. 11082.

FINANCIAL IMPLICATIONS:

Adoption of the Ordinance, together with adoption of the companion Ordinance re-adopting the 2021 International Energy Conservation Code, qualifies the City for grant funding under the Colorado Energy Office's building electrification and energy code adoption grant program at C.R.S. § 24-38.5-403, which provides up to two million dollars per qualifying jurisdiction to offset the costs of code adoption and enforcement. The City may apply for grant funding subsequent to adoption of both Ordinances.

The Ordinance imposes no direct cost on the City and no fee changes for permit applicants beyond those independently set by the Southern Colorado Building Commission and approved by the City and Town of Boone under the Intergovernmental Agreement.

BOARD/COMMISSION RECOMMENDATION:

The Southern Colorado Building Department recommends adoption of this Ordinance. Additionally, the code adopted by this Ordinance is the model code the State of Colorado has identified for adoption to comply with C.R.S. § 31-15-602(3.5)(a).

STAKEHOLDER PROCESS:

The Ordinance will be the subject of a public hearing as required by C.R.S. § 31-16-203. Notice of the public hearing will be published twice in a newspaper of general circulation in the City, with the first publication at least fifteen days before the hearing and the second at least eight days before the hearing. A certified true copy of the Colorado Model Electric Ready and Solar Ready Code, signed by the Mayor and the City Clerk, will be filed in the office of the City Clerk at least fifteen days before the public hearing and will be open to public inspection.

ALTERNATIVES:

If this Ordinance is not approved, or if the companion Ordinance re-adopting the 2021 International Energy Conservation Code is not approved, the City will not satisfy the dual performance requirement of C.R.S. § 31-15-602(3.5)(a) and will be ineligible for the Colorado Energy Office grant program at C.R.S. § 24-38.5-403. Continued non-compliance does not carry an immediate penalty under state law but is inconsistent with the City's general obligation under Charter Section 3-5(i) to faithfully execute and comply with all laws of the State of Colorado that apply to the City.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. Ordinance
2. Amended 2021 IECC City of Pueblo

ORDINANCE NO. _____

AN ORDINANCE AMENDING TITLE IV OF THE PUEBLO MUNICIPAL CODE BY CREATING A NEW CHAPTER 12 RELATING TO ENERGY CODE; ADOPTING BY REFERENCE THE COLORADO MODEL ELECTRIC READY AND SOLAR READY CODE; AMENDING SECTION 4-1-2 OF THE PUEBLO MUNICIPAL CODE TO ADD THE COLORADO MODEL ELECTRIC READY AND SOLAR READY CODE TO THE LIST OF MINOR OR SECONDARY CODES; AND PROVIDING PENALTIES AND REMEDIES FOR THE VIOLATION THEREOF

WHEREAS, the City of Pueblo, Colorado is a home rule municipality organized and existing under Article XX of the Colorado Constitution, which vests in home rule municipalities plenary authority over matters of local concern, including the adoption and enforcement of building codes; and

WHEREAS, the General Assembly of the State of Colorado enacted House Bill 22-1362 in 2022, codified in part at C.R.S. § 31-15-602(3.5)(a), which requires the governing body of any municipality that updates any building code between July 1, 2023 and June 30, 2026 to adopt an energy code that achieves equivalent or better energy performance than the 2021 International Energy Conservation Code and the model electric ready and solar ready code language adopted by the Colorado Energy Code Board; and

WHEREAS, the Colorado Energy Code Board, established under C.R.S. § 24-38.5-401, adopted the Colorado Model Electric Ready and Solar Ready Code, version 1.0, published June 1, 2023 by the Colorado Energy Office, 1600 Broadway, Suite 1960, Denver, Colorado 80202; and

WHEREAS, the City Council finds it appropriate to adopt the Colorado Model Electric Ready and Solar Ready Code by reference in a new Chapter 12 of Title IV of the Pueblo Municipal Code, in order to satisfy in part the requirement of C.R.S. § 31-15-602(3.5)(a); and

WHEREAS, the City Council finds it appropriate to expressly delete Section 109 (Board of Appeals) of the Colorado Model Electric Ready and Solar Ready Code, with appeals from any decision of the Building Official to be heard by the Building Board of Appeal established under Section 15(d) of the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department in accordance with the procedures set forth in Section 18 of that Agreement, to specify that the placeholder for the adopting jurisdiction in Section 101.1 of the Colorado Model Electric Ready and Solar Ready Code shall be deemed to read “City of Pueblo, Colorado,” to vest the authority to grant waivers under Sections 102.1.2 and 102.2 of the Colorado Model Electric Ready and Solar Ready Code in the Building Board of Appeal, and to specify that the fines referenced in Section 108.4 of the Colorado Model Electric Ready and Solar Ready Code

shall be as provided in Section 4-12-4 of this Code, none of which administrative amendments affects the energy performance of the code as adopted; and

WHEREAS, the City Council intends to introduce a companion Ordinance to repeal the existing local amendments to the 2021 International Energy Conservation Code under Ordinance No. 10466 and re-adopt that code by reference in the new Chapter 12 of Title IV, in order to fully satisfy the dual performance requirement of C.R.S. § 31-15-602(3.5)(a); and

WHEREAS, the procedures and requirements for adoption of codes by reference set forth at C.R.S. §§ 31-16-201 through 31-16-208 have been complied with, including the filing of a certified true copy of the Colorado Model Electric Ready and Solar Ready Code in the office of the City Clerk at least fifteen days preceding the public hearing on this Ordinance, and the publication of notice of the public hearing twice in a newspaper of general circulation in the City of Pueblo as required by C.R.S. § 31-16-203; and

WHEREAS, the penalty clauses applicable to violations of the code adopted by reference in this Ordinance are set forth in full in this Ordinance, as required by C.R.S. § 31-16-204; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Title IV of the Pueblo Municipal Code is amended by the addition of a new Chapter 12, to read as follows:

Chapter 12 Energy Code
Article I General Provisions

Sec. 4-12-1. Title.

This Chapter shall be known as the "Pueblo Energy Code," may be cited as such, and may be referred to herein as "this Chapter."

Sec. 4-12-2. Reserved.

Sec. 4-12-3. Adoption of Colorado Model Electric Ready and Solar Ready Code by reference.

(a) The Colorado Model Electric Ready and Solar Ready Code, version 1.0, adopted by the Colorado Energy Code Board pursuant to C.R.S. § 24-38.5-401 and published June 1, 2023 by the Colorado Energy Office, 1600 Broadway, Suite 1960, Denver, Colorado 80202, is hereby adopted by reference as a code of the City of Pueblo. One copy of the Colorado Model Electric Ready and Solar Ready Code, certified to be a true copy by the Mayor and the City Clerk, is on file in the office of the City Clerk and is open to public inspection. After the effective date of this Ordinance, a copy may be kept in the office of the Building Official as the chief enforcement officer in lieu of the office of the City Clerk.

(b) Notwithstanding the adoption by reference in subsection (a), Section 109, entitled "Board of Appeals," of the Colorado Model Electric Ready and Solar Ready Code is not adopted and is expressly deleted. Appeals from any decision of the Building Official under the Colorado Model Electric Ready and Solar Ready Code shall be filed with and decided by the Building Board of Appeal established under Section 15(d) of the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department, in accordance with the procedures set forth in Section 18 of that Agreement.

(c) The name of the jurisdiction for purposes of Section 101.1 of the Colorado Model Electric Ready and Solar Ready Code is "City of Pueblo, Colorado." Waivers permitted under Sections 102.1.2 (natural disaster) and 102.2 (substantial cost differential) of the Colorado Model Electric Ready and Solar Ready Code shall be granted, if at all, by the Building Board of Appeal established under Section 15(d) of the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department, in accordance with the procedures set forth in Section 18 of that Agreement. Fines referenced in Section 108.4 of the Colorado Model Electric Ready and Solar Ready Code shall be as provided in Section 4-12-4 of this Code.

Sec. 4-12-4. Penalties.

(a) Any person, firm, or corporation that violates any provision of the Colorado Model Electric Ready and Solar Ready Code as adopted by this Chapter, or any administrative provision related thereto, commits an offense punishable as provided in Section 1-2-1 of this Code. Each day during which a violation continues constitutes a separate offense.

(b) In addition to the criminal penalties provided in subsection (a), the City Attorney is authorized to institute civil actions for injunctive relief, abatement, or other equitable remedies in any court of competent jurisdiction to compel compliance with this Chapter and the code adopted herein.

(c) The remedies provided in this Section are cumulative, and the exercise of any one or more of them does not constitute a bar to or limitation on the exercise of any other.

Sec. 4-12-5. Responsibility for damages; liability of City.

The provisions of this Chapter and the code adopted by this Chapter shall not release or discharge any person from any liability imposed by law for any injury to persons or damage to property caused by or resulting from the performance or failure to perform work or the furnishing of materials covered by this Chapter. Neither the City, the Department, nor any of their agents or employees shall be held liable for any injury to persons or damage to property by reason of any inspection or failure to perform any inspection authorized or required by this Chapter or the code adopted herein.

Sec. 4-12-6. Enforcement.

The Building Official, the Building Official's designated representatives, and such building inspectors as the Building Official may appoint, are vested with the authority of a law enforcement officer with respect to enforcing this Chapter and the code adopted herein, including the authority to issue summons and complaints for violations thereof.

SECTION 2.

Section 4-1-2(f) of the Pueblo Municipal Code is amended to read as follows:

(f) *Minor or secondary codes* means any other building code which is adopted by reference, directly or indirectly, in whole or in part by ordinance or by express provisions of a major code including without limitation, the Unsafe Structures Regulations, Chapter 7 of this Title, herein Unsafe Structures Regulations; the International Property Maintenance Code as adopted with amendments by Chapter 1 of Title VIII of this Code, herein International Property Maintenance Code; **[**and**]** the International Energy Conservation Code**; and the Colorado Model Electric Ready and Solar Ready Code as adopted by Chapter 12 of this Title**.

SECTION 3.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance to effectuate the policies and procedures described herein, including without limitation the certification of a true copy of the Colorado Model Electric Ready and Solar Ready Code by the Mayor and the City Clerk in accordance with C.R.S. § 31-16-206, the publication of notice of the public hearing in accordance with C.R.S. § 31-16-203, and the publication of this Ordinance in full following adoption in accordance with C.R.S. § 31-16-205.

SECTION 4.

This Ordinance shall become effective thirty (30) days after final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on_____

☐ Council action on _____failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

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PREFACE

Introduction

The *International Energy Conservation Code*® (IECC®) establishes minimum requirements for energy-efficient buildings using prescriptive and performance-related provisions. It is founded on broad-based principles that make possible the use of new materials and new energy-efficient designs. This 2021 edition is fully compatible with all of the International Codes® (I-Codes®) published by the International Code Council® (ICC®), including the *International Building Code*® (IBC®), *International Existing Building Code*® (IEBC®), *International Fire Code*® (IFC®), *International Fuel Gas Code*® (IFGC®), *International Green Construction Code*® (IgCC®), *International Mechanical Code*® (IMC®), *International Plumbing Code*® (IPC®), *International Private Sewage Disposal Code*® (IPSDC®), *International Property Maintenance Code*® (IPMC®), *International Residential Code*® (IRC®), *International Swimming Pool and Spa Code*® (ISPSC®), *International Wildland-Urban Interface Code*® (IWUIC®), *International Zoning Code*® (IZC®) and *International Code Council Performance Code*® (ICCPC®).

This code contains separate provisions for commercial buildings and for low-rise residential buildings (3 stories or less in height above grade). Each set of provisions, IECC—Commercial Provisions and IECC—Residential Provisions, is separately applied to buildings within its respective scope. Each set of provisions is to be treated separately. Each contains a Scope and Administration chapter, a Definitions chapter, a General Requirements chapter, a chapter containing energy efficiency requirements and an Existing Buildings chapter containing provisions applicable to buildings within its scope.

The I-Codes, including the IECC, are used in a variety of ways in both the public and private sectors. Most industry professionals are familiar with the I-Codes as the basis of laws and regulations in communities across the US and in other countries. However, the impact of the codes extends well beyond the regulatory arena, as they are used in a variety of nonregulatory settings, including:

- Voluntary compliance programs such as those promoting sustainability, energy efficiency and disaster resistance.
- The insurance industry, to estimate and manage risk, and as a tool in underwriting and rate decisions.
- Certification and credentialing of individuals involved in the fields of building design, construction and safety.
- Certification of building and construction-related products.
- US federal agencies, to guide construction in an array of government-owned properties.
- Facilities management.
- “Best practices” benchmarks for designers and builders, including those who are engaged in projects in jurisdictions that do not have a formal regulatory system or a governmental enforcement mechanism.
- College, university and professional school textbooks and curricula.
- Reference works related to building design and construction.

In addition to the codes themselves, the code development process brings together building professionals on a regular basis. It provides an international forum for discussion and deliberation about building design, construction methods, safety, performance requirements, technological advances and innovative products.

Development

This 2021 edition presents the code as originally issued, with changes reflected in the 2000 through 2018 editions and further changes approved through the ICC Code Development Process through 2019. A new edition such as this is promulgated every 3 years.

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This code is founded on principles intended to establish provisions consistent with the scope of an energy conservation code that adequately conserves energy; provisions that do not unnecessarily increase construction costs; provisions that do not restrict the use of new materials, products or methods of construction; and provisions that do not give preferential treatment to particular types or classes of materials, products or methods of construction.

Maintenance

The IECC is kept up to date through the review of proposed changes submitted by code enforcement officials, industry representatives, design professionals and other interested parties. Proposed changes are carefully considered through an open code development process in which all interested and affected parties may participate.

The ICC Code Development Process reflects principles of openness, transparency, balance, due process and consensus, the principles embodied in OMB Circular A-119, which governs the federal government's use of private-sector standards. The ICC process is open to anyone; there is no cost to participate, and people can participate without travel cost through the ICC's cloud-based app, cdpACCESS®. A broad cross-section of interests are represented in the ICC Code Development Process. The codes, which are updated regularly, include safeguards that allow for emergency action when required for health and safety reasons.

In order to ensure that organizations with a direct and material interest in the codes have a voice in the process, the ICC has developed partnerships with key industry segments that support the ICC's important public safety mission. Some code development committee members were nominated by the following industry partners and approved by the ICC Board:

- National Association of Home Builders (NAHB)
- National Multifamily Housing Council (NMHC)

The code development committees evaluate and make recommendations regarding proposed changes to the codes. Their recommendations are then subject to public comment and council-wide votes. The ICC's governmental members—public safety officials who have no financial or business interest in the outcome—cast the final votes on proposed changes.

The contents of this work are subject to change through the code development cycles and by any governmental entity that enacts the code into law. For more information regarding the code development process, contact the Codes and Standards Development Department of the ICC.

While the I-Code development procedure is thorough and comprehensive, the ICC, its members and those participating in the development of the codes disclaim any liability resulting from the publication or use of the I-Codes, or from compliance or noncompliance with their provisions. The ICC does not have the power or authority to police or enforce compliance with the contents of this code.

Code Development Committee Responsibilities (Letter Designations in Front of Section Numbers)

In each code development cycle, proposed changes to this code are considered at the Committee Action Hearings by the applicable International Code Development Committee. The IECC—Commercial Provisions (sections designated with a "C" prior to the section number) are primarily maintained by the Commercial Energy Code Development Committee. The IECC—Residential Provisions (sections designated with an "R" prior to the section number) are maintained by the Residential Energy Code Development Committee. This is designated in the chapter headings by a [CE] and [RE], respectively.

Maintenance responsibilities for the IECC are designated as follows:

[CE] = International Commercial Energy Conservation Code Development Committee

[RE] = International Residential Energy Conservation Code Development Committee

For the development of the 2024 edition of the I-Codes, there will be two groups of code development committees and they will meet in separate years, as shown in the following Code Development Hearings Table.

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Code change proposals submitted for code sections that have a letter designation in front of them will be heard by the respective committee responsible for such code sections. Because different committees hold Committee Action Hearings in different years, proposals for several I-Codes will be heard by committees in both the 2021 (Group A) and the 2022 (Group B) code development cycles.

All code change proposals for the IECC are considered in the Group B hearings.

It is very important that anyone submitting code change proposals understands which code development committee is responsible for the section of the code that is the subject of the code change proposal. For further information on the Code Development Committee responsibilities, please visit the ICC website at www.iccsafe.org/current-code-development-cycle.

CODE DEVELOPMENT HEARINGS

Group A Codes (Heard in 2021, Code Change Proposals Deadline: January 11, 2021)	Group B Codes (Heard in 2022, Code Change Proposals Deadline: January 10, 2022)
International Building Code – Egress (Chapters 10, 11, Appendix E) – Fire Safety (Chapters 7, 8, 9, 14, 26) – General (Chapters 2–6, 12, 27–33, Appendices A, B, C, D, K, N)	Administrative Provisions (Chapter 1 of all codes except IECC, IRC and IgCC; IBC Appendix O; the appendices titled "Board of Appeals" for all codes except IECC, IRC, IgCC, ICCPC and IZC; administrative updates to currently referenced standards; and designated definitions)
International Fire Code	**International Building Code** – Structural (Chapters 15–25, Appendices F, G, H, I, J, L, M)
International Fuel Gas Code	**International Existing Building Code**
International Mechanical Code	**International Energy Conservation Code—Commercial**
International Plumbing Code	**International Energy Conservation Code—Residential** – IECC—Residential – IRC—Energy (Chapter 11)
International Property Maintenance Code	**International Green Construction Code** (Chapter 1)
International Private Sewage Disposal Code	**International Residential Code** – IRC—Building (Chapters 1–10, Appendices AE, AF, AH, AJ, AK, AL, AM, AO, AQ, AR, AS, AT, AU, AV, AW)
International Residential Code – IRC—Mechanical (Chapters 12–23) – IRC—Plumbing (Chapters 25–33, Appendices AG, AI, AN, AP)	
International Swimming Pool and Spa Code	
International Wildland-Urban Interface Code	
International Zoning Code	

Note: Proposed changes to the ICCPC will be heard by the code development committee noted in brackets [ ] in the text of the ICCPC.

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Marginal Markings

Solid vertical lines in the margins within the body of the code indicate a technical change from the requirements of the 2018 edition. Deletion indicators in the form of an arrow (➡) are provided in the margin where an entire section, exception or table has been deleted or an item in a list of items or row of a table has been deleted.

A single asterisk [*] placed in the margin indicates that text or a table has been relocated within the code. A double asterisk [**] placed in the margin indicates that the text or table immediately following it has been relocated there from elsewhere in the code. The following tables indicate such relocations in the 2021 edition of the IECC.

IECC COMMERCIAL RELOCATIONS

2021 LOCATION	2018 LOCATION
C402.2.1.5	C402.2.1.1
C404.6.1.1	C404.7
C405.2.3.1	C405.2.2.2
C405.2.4	C405.2.3
C501.2	C501.4
C503.2.2.1	C401.2.1

IECC RESIDENTIAL RELOCATIONS

2021 LOCATION	2018 LOCATION
Table R402.1.2	Table R402.1.4
Table R402.1.3	Table R402.1.2
R403.3.2	R403.3.7
R403.3.3	R403.3.6
R403.3.3.1	R403.3.6.1
R403.3.4	R403.3.2
R403.3.4.1	R403.3.2.1
R403.3.5	R403.3.3
R403.3.6	R403.3.4
R403.3.7	R403.3.5

Coordination of the International Codes

The coordination of technical provisions is one of the strengths of the ICC family of model codes. The codes can be used as a complete set of complementary documents, which will provide users with full integration and coordination of technical provisions. Individual codes can also be used in subsets or as stand-alone documents. To make sure that each individual code is as complete as possible, some technical provisions that are relevant to more than one subject area are duplicated in some of the model codes. This allows users maximum flexibility in their application of the I-Codes.

Italicized Terms

Terms italicized in code text, other than document titles, are defined in Chapter 2. The terms selected to be italicized have definitions that the user should read carefully to better understand the code. Where italicized, the Chapter 2 definition applies. If not italicized, common-use definitions apply.

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Adoption

The ICC maintains a copyright in all of its codes and standards. Maintaining copyright allows the ICC to fund its mission through sales of books, in both print and electronic formats. The ICC welcomes adoption of its codes by jurisdictions that recognize and acknowledge the ICC's copyright in the code, and further acknowledge the substantial shared value of the public/private partnership for code development between jurisdictions and the ICC.

The ICC also recognizes the need for jurisdictions to make laws available to the public. All I-Codes and I-Standards, along with the laws of many jurisdictions, are available for free in a non-downloadable form on the ICC's website. Jurisdictions should contact the ICC at adoptions@iccsafe.org to learn how to adopt and distribute laws based on the IECC in a manner that provides necessary access, while maintaining the ICC's copyright.

To facilitate adoption, two sections of this code contain blanks for fill-in information that needs to be supplied by the adopting jurisdiction as part of the adoption legislation. For this code, please see:

Section C101.1. Insert: **[NAME OF JURISDICTION]**.

Section R101.1. Insert: **[NAME OF JURISDICTION]**.

Effective Use of the International Energy Conservation Code

The IECC is a model code that regulates minimum energy conservation requirements for new buildings. The IECC addresses energy conservation requirements for all aspects of energy use in both commercial and residential construction, including heating and ventilating, lighting, water heating, and power usage for appliances and building systems.

The IECC is a design document. For example, before one constructs a building, the designer must determine the minimum insulation *R*-values and fenestration *U*-factors for the building exterior envelope. Depending on whether the building is for residential use or for commercial use, the IECC sets forth minimum requirements for exterior envelope insulation, window and door *U*-factors and SHGC ratings, duct insulation, lighting and power efficiency, and water distribution insulation.

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ARRANGEMENT AND FORMAT OF THE 2021 IECC

The IECC contains two separate sets of provisions—one for commercial buildings and one for residential buildings. Each set of provisions is applied separately to buildings within their scope. The IECC—Commercial Provisions apply to all buildings except for residential buildings three stories or less in height. The IECC—Residential Provisions apply to detached one- and two-family dwellings and multiple single-family dwellings as well as Group R-2, R-3 and R-4 buildings three stories or less in height. These scopes are based on the definitions of "Commercial building" and "Residential building," respectively, in Chapter 2 of each set of provisions. Note that the IECC—Commercial Provisions therefore contain provisions for residential buildings four stories or greater in height.

The following table shows how the IECC is divided. The ensuing chapter-by-chapter synopsis details the scope and intent of the provisions of the IECC.

Chapter Topics

Chapter	Subjects
1–2	Administration and definitions
3	Climate zones and general materials requirements
4	Energy efficiency requirements
5	Existing buildings
6	Referenced standards
CA	Board of appeals
CB	Solar-ready zone
CC	Net zero energy

Chapter 1 Scope and Administration

Chapters 1 [CE] and 1 [RE] contain provisions for the application, enforcement and administration of subsequent requirements of the code. In addition to establishing the scope of the code, Chapter 1 identifies which buildings and structures come under its purview. Chapter 1 is largely concerned with maintaining "due process of law" in enforcing the energy conservation criteria contained in the body of this code. Only through careful observation of the administrative provisions can the code official reasonably expect to demonstrate that "equal protection under the law" has been provided.

Chapter 2 Definitions

Terms that are defined in the code are listed alphabetically in Chapters 2 [CE] and 2 [RE]. While a defined term may be used in one chapter or another, the meaning provided in Chapter 2 is applicable throughout the code.

Additional definitions regarding climate zones are found in Tables C301.3 and R301.3. These are not listed in Chapter 2.

Where understanding of a term's definition is especially key to or necessary for understanding of a particular code provision, the term is shown in italics. This is true only for those terms that have a meaning that is unique to the code. In other words, the generally understood meaning of a term or phrase might not be sufficient or consistent with the meaning prescribed by the code; therefore, it is essential that the code-defined meaning be known.

Guidance regarding tense, gender and plurality of defined terms as well as guidance regarding terms not defined in this code is provided.

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Chapter 3 General Requirements

Chapters 3 [CE] and 3 [RE] specify the climate zones that will serve to establish the exterior design conditions. In addition, Chapter 3 provides interior design conditions that are used as a basis for assumptions in heating and cooling load calculations, and provides basic material requirements for insulation materials and fenestration materials. Climate has a major impact on the energy use of most buildings. The code establishes many requirements such as wall and roof insulation *R*-values, window and door thermal transmittance (*U*-factors) and provisions that affect the mechanical systems based on the climate where the building is located. This chapter contains information that will be used to properly assign the building location into the correct climate zone and is used as the basis for establishing or eliminating requirements.

Chapter 4 Energy Efficiency

Chapter 4 [CE] contains the energy-efficiency-related requirements for the design and construction of most types of commercial buildings and residential buildings greater than three stories in height above grade. This chapter defines requirements for the portions of the building and building systems that impact energy use in new commercial construction and new residential construction greater than three stories in height, and promotes the effective use of energy. In addition to energy conservation requirements for the building envelope, this chapter contains requirements that impact energy efficiency for the HVAC systems, the electrical systems and the plumbing systems. It should be noted, however, that requirements are contained in other codes that have an impact on energy conservation. For instance, requirements for water flow rates are regulated by the *International Plumbing Code*.

Chapter 4 [RE] contains the energy-efficiency-related requirements for the design and construction of residential buildings regulated under this code. It should be noted that the definition of a residential building in this code is unique for this code. In this code, residential buildings include detached one- and two-family dwellings and multiple single-family dwellings as well as R-2, R-3 or R-4 buildings three stories or less in height. All other buildings, including residential buildings greater than three stories in height, are regulated by the energy conservation requirements in the IECC—Commercial Provisions. The applicable portions of a residential building must comply with the provisions within this chapter for energy efficiency. This chapter defines requirements for the portions of the building and building systems that impact energy use in new residential construction and promotes the effective use of energy. The provisions within the chapter promote energy efficiency in the building envelope, the heating and cooling system and the service water-heating system of the building.

Chapter 5 Existing Buildings

Chapters 5 [CE] and [RE] contain the technical energy efficiency requirements for existing buildings. Chapter 5 provisions address the maintenance of buildings in compliance with the code as well as how additions, alterations, repairs and changes of occupancy need to be addressed from the standpoint of energy efficiency. Specific provisions are provided for historic buildings.

Chapter 6 Referenced Standards

The code contains numerous references to standards that are used to regulate materials and methods of construction. Chapters 6 [CE] and 6 [RE] list all standards referenced in their respective portions of the code. The standards are part of the code to the extent of the reference to the standard. Compliance with the referenced standard is necessary for compliance with this code. By providing specifically adopted standards, the construction and installation requirements necessary for compliance with the code can be readily determined. The basis for code compliance is, therefore, established and available on an equal basis to the code official, contractor, designer and owner.

Chapter 6 is organized in a manner that makes it easy to locate specific standards. It lists all of the referenced standards, alphabetically, by acronym of the promulgating agency of the standard. Each agency's standards are then listed in either alphabetical or numeric order based on the standard identification. The list also contains the title of the standard; the edition (date) of the standard referenced; any addenda included as part of the ICC adoption; and the section or sections of this code that reference the standard.

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Appendices

The appendices, while not part of the code, can become part of the code when specifically included in the adopting ordinance.

Chapter 1 requires the establishment of a board of appeals to hear appeals regarding determinations made by the code official. Appendices CA and RA provide qualification standards for members of the board as well as operational procedures of such board.

Appendices CB and RB address provisions for solar capacity in new structures.

Appendices CC and RC provide requirements intended bring about net zero annual energy consumption in their respective structures.

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ABBREVIATIONS AND NOTATIONS

The following table contains a list of common abbreviations and units of measurement used in this code. Some of the abbreviations are for terms defined in Chapter 2. Others are terms used in various tables and text of the code.

Abbreviations and Notations

AFUE	Annual fuel utilization efficiency
bhp	Brake horsepower (fans)
Btu	British thermal unit
Btu/h × ft^2	Btu per hour per square foot
C-factor	See Chapter 2—Definitions
CDD	Cooling degree days
cfm	Cubic feet per minute
cfm/ft^2	Cubic feet per minute per square foot
ci	Continuous insulation
COP	Coefficient of performance
DCV	Demand control ventilation
°C	Degrees Celsius
°F	Degrees Fahrenheit
DWHR	Drain water heat recovery
DX	Direct expansion
E_c	Combustion efficiency
E_v	Ventilation efficiency
E_t	Thermal efficiency
EER	Energy efficiency ratio
EF	Energy factor
ERI	Energy rating index
F-factor	See Chapter 2—Definitions
FDD	Fault detection and diagnostics
FEI	Fan energy index
FL	Full load
ft^2	Square foot
gpm	Gallons per minute
HDD	Heating degree days
hp	Horsepower
HSPF	Heating seasonal performance factor
HVAC	Heating, ventilating and air conditioning

(continued)

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Abbreviations and Notations—continued

IEER	Integrated energy efficiency ratio
IPLV	Integrated Part Load Value
Kg/m^2	Kilograms per square meter
kW	Kilowatt
LPD	Light power density (lighting power allowance)
L/s	Liters per second
Ls	Liner system
m^2	Square meters
MERV	Minimum efficiency reporting value
NAECA	National Appliance Energy Conservation Act
NPLV	Nonstandard Part Load Value
Pa	Pascal
PF	Projection factor
pcf	Pounds per cubic foot
psf	Pounds per square foot
PTAC	Packaged terminal air conditioner
PTHP	Packaged terminal heat pump
R-value	See Chapter 2—Definitions
SCOP	Sensible coefficient of performance
SEER	Seasonal energy efficiency ratio
SHGC	Solar Heat Gain Coefficient
SPVAC	Single packaged vertical air conditioner
SPVHP	Single packaged vertical heat pump
SRI	Solar reflectance index
SWHF	Service water heat recovery factor
U-factor	See Chapter 2—Definitions
VAV	Variable air volume
VRF	Variable refrigerant flow
VT	Visible transmittance
W	Watts
w.c.	Water column
w.g.	Water gauge

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CHAPTER 1 [CE]
SCOPE AND ADMINISTRATION

User note:

About this chapter: *Chapter 1 establishes the limits of applicability of the code and describes how the code is to be applied and enforced. Chapter 1 is in two parts: Part 1—Scope and Application and Part 2—Administration and Enforcement. Section C101 identifies what buildings, systems, appliances and equipment fall under its purview and references other I-Codes as applicable. Standards and codes are scoped to the extent referenced.*

The code is intended to be adopted as a legally enforceable document and it cannot be effective without adequate provisions for its administration and enforcement. The provisions of Chapter 1 establish the authority and duties of the code official appointed by the authority having jurisdiction and also establish the rights and privileges of the design professional, contractor and property owner.

PART 1—SCOPE AND APPLICATION

SECTION C101
SCOPE AND GENERAL REQUIREMENTS

C101.1 Title. This code shall be known as the *Energy Conservation Code* of **the City of Pueblo, Colorado** , and shall be cited as such. It is referred to herein as "this code."

C101.2 Scope. This code applies to *commercial buildings* and the buildings' sites and associated systems and equipment.

C101.3 Intent. This code shall regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

C101.4 Applicability. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

C101.4.1 Mixed residential and commercial buildings. Where a building includes both *residential building* and *commercial building* portions, each portion shall be separately considered and meet the applicable provisions of IECC—Commercial Provisions or IECC—Residential Provisions.

C101.5 Compliance. *Residential buildings* shall meet the provisions of IECC—Residential Provisions. *Commercial buildings* shall meet the provisions of IECC—Commercial Provisions.

C101.5.1 Compliance materials. The *code official* shall be permitted to approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code.

SECTION C102
ALTERNATIVE MATERIALS, DESIGN AND METHODS OF CONSTRUCTION AND EQUIPMENT

C102.1 General. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. The code official shall have the authority to approve an alternative material, design or method of construction upon the written application of the owner or the owner's authorized agent. The *code official* shall first find that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability, energy conservation and safety. The *code official* shall respond to the applicant, in writing, stating the reasons why the alternative was approved or was not *approved*.

C102.1.1 Above code programs. The *code official* or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program as exceeding the energy efficiency required by this code. Buildings *approved* in writing by such an energy efficiency program shall be considered to be in compliance with this code. The requirements identified in Table C407.2 shall be met.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION C103
CONSTRUCTION DOCUMENTS

C103.1 General. Construction documents and other supporting data shall be submitted in one or more sets, or in a digital format where allowed by the building official, with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction

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documents to be prepared by a registered design professional.

Exception: The *code official* is authorized to waive the requirements for construction documents or other supporting data if the *code official* determines they are not necessary to confirm compliance with this code.

C103.2 Information on construction documents. Construction documents shall be drawn to scale on suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Energy compliance path.
2. Insulation materials and their *R*-values.
3. Fenestration *U*-factors and solar heat gain coefficients (SHGCs).
4. Area-weighted *U*-factor and solar heat gain coefficient (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water-heating systems and equipment types, sizes and efficiencies.
7. Economizer description.
8. Equipment and system controls.
9. Fan motor horsepower (hp) and controls.
10. Duct sealing, duct and pipe insulation and location.
11. Lighting fixture schedule with wattage and control narrative.
12. Location of *daylight* zones on floor plans.
13. Air barrier and air sealing details, including the location of the air barrier.

C103.2.1 Building thermal envelope depiction. The *building thermal envelope* shall be represented on the construction drawings.

C103.3 Examination of documents. The *code official* shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances. The *code official* is authorized to utilize a registered design professional, or other *approved* entity not affiliated with the building design or construction, in conducting the review of the plans and specifications for compliance with the code.

C103.3.1 Approval of construction documents. When the *code official* issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped "Reviewed for Code Compliance." Such *approved* construction documents shall not be changed, modified or altered without authorization from the *code official*. Work shall be done in accordance with the *approved* construction documents.

One set of construction documents so reviewed shall be retained by the *code official*. The other set shall be returned to the applicant, kept at the site of work and shall be open to inspection by the *code official* or a duly authorized representative.

C103.3.2 Previous approvals. This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

C103.3.3 Phased approval. The *code official* shall have the authority to issue a permit for the construction of part of an energy conservation system before the construction documents for the entire system have been submitted or *approved*, provided that adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holders of such permit shall proceed at their own risk without assurance that the permit for the entire energy conservation system will be granted.

C103.4 Amended construction documents. Changes made during construction that are not in compliance with the *approved* construction documents shall be resubmitted for approval as an amended set of construction documents.

C103.5 Retention of construction documents. One set of *approved* construction documents shall be retained by the *code official* for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

C103.6 Building documentation and closeout submittal requirements. The construction documents shall specify that the documents described in this section be provided to the building owner or owner's authorized agent within 90 days of the date of receipt of the certificate of occupancy.

C103.6.1 Record documents. Construction documents shall be updated to convey a record of the completed work. Such updates shall include mechanical, electrical and control drawings that indicate all changes to size, type and location of components, equipment and assemblies.

C103.6.2 Compliance documentation. Energy code compliance documentation and supporting calculations shall be delivered in one document to the building owner as part of the project record documents or manuals, or as a standalone document. This document shall include the specific energy code edition utilized for compliance determination for each system, documentation demonstrating compliance with Section C303.1.3 for each fenestration product installed, and the interior lighting power compliance path, building area or space-by-space, used to calculate the lighting power allowance.

For projects complying with Item 2 of Section C401.2, the documentation shall include:

1. The envelope insulation compliance path.

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2. All compliance calculations including those required by Sections C402.1.5, C403.8.1, C405.3 and C405.5.

For projects complying with Section C407, the documentation shall include that required by Sections C407.3.1 and C407.3.2.

C103.6.3 Systems operation control. Training shall be provided to those responsible for maintaining and operating equipment included in the manuals required by Section C103.6.2.

The training shall include:

1. Review of manuals and permanent certificate.
2. Hands-on demonstration of all normal maintenance procedures, normal operating modes, and all emergency shutdown and startup procedures.
3. Training completion report.

SECTION C104
FEES

C104.1 Fees. A permit shall not be issued until the fees prescribed in Section C104.2 have been paid, nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

C104.2 Schedule of permit fees. A fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

C104.3 Work commencing before permit issuance. Any person who commences any work before obtaining the necessary permits shall be subject to an additional fee established by the *code official* that shall be in addition to the required permit fees.

C104.4 Related fees. The payment of the fee for the construction, *alteration*, removal or demolition of work done in connection to or concurrently with the work or activity authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

C104.5 Refunds. The *code official* is authorized to establish a refund policy.

SECTION C105
INSPECTIONS

C105.1 General. Construction or work for which a permit is required shall be subject to inspection by the code official, his or her designated agent or an *approved agency*, and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain visible and able to be accessed for inspection purposes. Neither the code official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material, product, system or building component required to allow inspection to validate compliance with this code.

C105.2 Required inspections. The *code official*, his or her designated agent or an *approved agency*, upon notification, shall make the inspections set forth in Sections C105.2.1 through C105.2.6.

C105.2.1 Footing and foundation insulation. Inspections shall verify the footing and foundation insulation *R*-value, location, thickness, depth of burial and protection of insulation as required by the code, *approved* plans and specifications.

C105.2.2 Thermal envelope. Inspections shall verify the correct type of insulation, *R*-values, location of insulation, fenestration, *U*-factor, SHGC and VT, and that air leakage controls are properly installed, as required by the code, *approved* plans and specifications.

C105.2.3 Plumbing system. Inspections shall verify the type of insulation, *R*-values, protection required, controls and heat traps as required by the code, *approved* plans and specifications.

C105.2.4 Mechanical system. Inspections shall verify the installed HVAC equipment for the correct type and size, controls, insulation, *R*-values, system and damper air leakage, minimum fan efficiency, energy recovery and economizer as required by the code, *approved* plans and specifications.

C105.2.5 Electrical system. Inspections shall verify lighting system controls, components and meters as required by the code, *approved* plans and specifications.

C105.2.6 Final inspection. The final inspection shall include verification of the installation and proper operation of all required building controls, and documentation verifying activities associated with required *building commissioning* have been conducted in accordance with Section C408.

C105.3 Reinspection. A building shall be reinspected where determined necessary by the *code official*.

C105.4 Approved inspection agencies. The *code official* is authorized to accept reports of third-party inspection agencies not affiliated with the building design or construction, provided that such agencies are *approved* as to qualifications and reliability relevant to the building components and systems that they are inspecting.

C105.5 Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the *code official* when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

C105.6 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made to achieve compliance

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with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

SECTION C106
NOTICE OF APPROVAL

C106.1 Approval. After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code *official*.

C106.2 Revocation. The *code official* is authorized to suspend or revoke, in writing, a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the *building* or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION C107
VALIDITY

C107.1 General. If a portion of this code is held to be illegal or void, such a decision shall not affect the validity of the remainder of this code.

SECTION C108
REFERENCED STANDARDS

C108.1 Referenced codes and standards. The codes and standards referenced in this code shall be those listed in Chapter 6, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections C108.1.1 and C108.1.2.

C108.1.1 Conflicts. Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

C108.1.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

C108.2 Applications of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

C108.3 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

SECTION C109
STOP WORK ORDER

C109.1 Authority. Where the *code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the *code official* is authorized to issue a stop work order.

C109.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property, the owner's authorized agent or the person performing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume.

C109.3 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

C109.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fines established by the authority having jurisdiction.

SECTION C110
BOARD OF APPEALS

C110.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The *code official* shall be an ex officio member of said board but shall not have a vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

C110.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall not have authority to waive requirements of this code.

C110.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction.

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CHAPTER 2 [CE]
DEFINITIONS

User note:

About this chapter: *Codes, by their very nature, are technical documents. Every word, term and punctuation mark can add to or change the meaning of a technical requirement. It is necessary to maintain a consensus on the specific meaning of each term contained in the code. Chapter 2 performs this function by stating clearly what specific terms mean for the purposes of the code.*

SECTION C201
GENERAL

C201.1 Scope. Unless stated otherwise, the following words and terms in this code shall have the meanings indicated in this chapter.

C201.2 Interchangeability. Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural includes the singular.

C201.3 Terms defined in other codes. Terms that are not defined in this code but are defined in the *International Building Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *International Plumbing Code* or the *International Residential Code* shall have the meanings ascribed to them in those codes.

C201.4 Terms not defined. Terms not defined by this chapter shall have ordinarily accepted meanings such as the context implies.

SECTION C202
GENERAL DEFINITIONS

ABOVE-GRADE WALL. See "*Wall, above-grade*."

ACCESS (TO). That which enables a device, appliance or equipment to be reached by *ready access* or by a means that first requires the removal or movement of a panel or similar obstruction.

ADDITION. An extension or increase in the *conditioned space* floor area, number of stories or height of a building or structure.

AIR BARRIER. One or more materials joined together in a continuous manner to restrict or prevent the passage of air through the *building thermal envelope* and its assemblies.

AIR CURTAIN. A device, installed at the *building entrance*, that generates and discharges a laminar air stream intended to prevent the infiltration of external, unconditioned air into the conditioned spaces, or the loss of interior, conditioned air to the outside.

ALTERATION. Any construction, retrofit or renovation to an existing structure other than repair or addition. Also, a change in a building, electrical, gas, mechanical or plumbing system that involves an extension, addition or change to the arrangement, type or purpose of the original installation.

APPROVED. Acceptable to the code official.

APPROVED AGENCY. An established and recognized agency that is regularly engaged in conducting tests or furnishing inspection services, or furnishing product certification, where such agency has been approved by the *code official*.

AUTOMATIC. Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current strength, pressure, temperature or mechanical configuration (see "*Manual*").

BELOW-GRADE WALL. See "*Wall, below-grade*."

BIOGAS. A mixture of hydrocarbons that is a gas at 60°F (15.5°C) and 1 atmosphere of pressure that is produced through the anaerobic digestion of organic matter.

BIOMASS. Nonfossilized and biodegradable organic material originating from plants, animals and/or microorganisms, including products, by-products, residues and waste from agriculture, forestry and related industries as well as the nonfossilized and biodegradable organic fractions of industrial and municipal wastes, including gases and liquids recovered from the decomposition of nonfossilized and biodegradable organic material.

BOILER, MODULATING. A boiler that is capable of more than a single firing rate in response to a varying temperature or heating load.

BOILER SYSTEM. One or more boilers, their piping and controls that work together to supply steam or hot water to heat output devices remote from the boiler.

BUBBLE POINT. The refrigerant liquid saturation temperature at a specified pressure.

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy, including any mechanical systems, service water-heating systems and electric power and lighting systems located on the building site and supporting the building.

BUILDING COMMISSIONING. A process that verifies and documents that the selected building systems have been designed, installed and function according to the owner's project requirements and construction documents, and to minimum code requirements.

BUILDING ENTRANCE. Any door, set of doors, doorway or other form of portal that is used to gain access to the building from the outside by the public.

BUILDING SITE. A contiguous area of land that is under the ownership or control of one entity.

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BUILDING THERMAL ENVELOPE. The basement walls, exterior walls, floors, ceilings, roofs and any other building element assemblies that enclose *conditioned space* or provide a boundary between *conditioned space* and exempt or unconditioned space.

CAPTIVE KEY OVERRIDE. A lighting control that will not release the key that activates the override when the lighting is on.

CAVITY INSULATION. Insulating material located between framing members.

***C*-FACTOR (THERMAL CONDUCTANCE).** The coefficient of heat transmission (surface to surface) through a building component or assembly, equal to the time rate of heat flow per unit area and the unit temperature difference between the warm side and cold side surfaces (Btu/h × ft^2 × °F) [W/(m^2 × K)].

CHANGE OF OCCUPANCY. A change in the use of a building or a portion of a building that results in any of the following:

1. A *change of occupancy* classification.
2. A change from one group to another group within an occupancy classification.
3. Any change in use within a group for which there is a change in the application of the requirements of this code.

CIRCULATING HOT WATER SYSTEM. A specifically designed water distribution system where one or more pumps are operated in the service hot water piping to circulate heated water from the water-heating equipment to the fixture supply and back to the water-heating equipment.

CLIMATE ZONE. A geographical region based on climatic criteria as specified in this code.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

COEFFICIENT OF PERFORMANCE (COP) − COOLING. The ratio of the rate of heat removal to the rate of energy input, in consistent units, for a complete refrigerating system or some specific portion of that system under designated operating conditions.

COEFFICIENT OF PERFORMANCE (COP) − HEATING. The ratio of the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system, including the compressor and, if applicable, auxiliary heat, under designated operating conditions.

COMMERCIAL BUILDING. For this code, all buildings that are not included in the definition of "*Residential building*."

COMPUTER ROOM. A room whose primary function is to house equipment for the processing and storage of electronic data which has a design total information technology equipment (ITE) equipment power density less than or equal to 20 watts per square foot (20 watts per 0.092 m^2) of conditioned area or a design total ITE equipment load less than or equal to 10 kW.

CONDENSING UNIT. A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more refrigerant compressors, refrigerant condensers (air-cooled, evaporatively cooled or water-cooled), condenser fans and motors (where used) and factory-supplied accessories.

CONDITIONED FLOOR AREA. The horizontal projection of the floors associated with the *conditioned space*.

CONDITIONED SPACE. An area, room or space that is enclosed within the *building thermal envelope* and is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior or is integral to any opaque surface of the building envelope.

CRAWL SPACE WALL. The opaque portion of a wall that encloses a crawl space and is partially or totally below grade.

CURTAIN WALL. Fenestration products used to create an external nonload-bearing wall that is designed to separate the exterior and interior environments.

DATA CENTER. A room or series of rooms that share data center systems, whose primary function is to house equipment for the processing and storage of electronic data and that has a design total ITE equipment power density exceeding 20 watts per square foot (20 watts per 0.092 m^2) of conditioned area and a total design ITE equipment load greater than 10 kW.

DATA CENTER SYSTEMS. HVAC systems and equipment, or portions thereof, used to provide cooling or ventilation in a data center.

DAYLIGHT RESPONSIVE CONTROL. A device or system that provides automatic control of electric light levels based on the amount of daylight in a space.

DAYLIGHT ZONE. That portion of a building's interior floor area that is illuminated by natural light.

DEMAND CONTROL VENTILATION (DCV). A ventilation system capability that provides for the automatic reduction of outdoor air intake below design rates when the actual occupancy of spaces served by the system is less than design occupancy.

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where one or more pumps prime the service hot water piping with heated water upon a demand for hot water.

DIRECT DIGITAL CONTROL (DDC). A type of control where controlled and monitored analog or binary data, such as temperature and contact closures, are converted to digital format for manipulation and calculations by a digital computer or microprocessor, then converted back to analog or binary form to control physical devices.

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DUCT. A tube or conduit utilized for conveying air. The air passages of self-contained systems are not to be construed as air ducts.

DUCT SYSTEM. A continuous passageway for the transmission of air that, in addition to ducts, includes duct fittings, dampers, plenums, fans and accessory air-handling equipment and appliances.

DWELLING UNIT. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

DYNAMIC GLAZING. Any fenestration product that has the fully reversible ability to change its performance properties, including *U*-factor, solar heat gain coefficient (SHGC) or visible transmittance (VT).

ECONOMIZER, AIR. A duct and damper arrangement and automatic control system that allows a cooling system to supply outside air to reduce or eliminate the need for mechanical cooling during mild or cold weather.

ECONOMIZER, WATER. A system where the supply air of a cooling system is cooled indirectly with water that is itself cooled by heat or mass transfer to the environment without the use of mechanical cooling.

ENCLOSED SPACE. A volume surrounded by solid surfaces such as walls, floors, roofs and openable devices, such as doors and operable windows.

ENERGY ANALYSIS. A method for estimating the annual energy use of the *proposed design* and *standard reference design* based on estimates of energy use.

ENERGY COST. The total estimated annual cost for purchased energy for the building functions regulated by this code, including applicable demand charges.

ENERGY RECOVERY VENTILATION SYSTEM. Systems that employ air-to-air heat exchangers to recover energy from exhaust air for the purpose of preheating, precooling, humidifying or dehumidifying outdoor ventilation air prior to supplying the air to a space, either directly or as part of an HVAC system.

ENERGY SIMULATION TOOL. An *approved* software program or calculation-based methodology that projects the annual energy use of a building.

ENTHALPY RECOVERY RATIO. Change in the enthalpy of the *outdoor air* supply divided by the difference between the *outdoor air* and entering exhaust air enthalpy, expressed as a percentage.

ENTRANCE DOOR. A vertical fenestration product used for occupant ingress, egress and access in nonresidential buildings, including, but not limited to, exterior entrances utilizing latching hardware and automatic closers and containing over 50 percent glazing specifically designed to withstand heavy-duty usage.

EQUIPMENT ROOM. A space that contains either electrical equipment, mechanical equipment, machinery, water pumps or hydraulic pumps that are a function of the building's services.

EXTERIOR WALL. Walls including both above-grade walls and basement walls.

FAN, EMBEDDED. A fan that is part of a manufactured assembly where the assembly includes functions other than air movement.

FAN ARRAY. Multiple fans in parallel between two plenum sections in an air distribution system.

FAN BRAKE HORSEPOWER (BHP). The horsepower delivered to the fan's shaft. Brake horsepower does not include the mechanical drive losses, such as that from belts and gears.

FAN ENERGY INDEX (FEI). The ratio of the electric input power of a reference fan to the electric input power of the actual fan as calculated in accordance with AMCA 208.

FAN NAMEPLATE ELECTRICAL INPUT POWER. The nominal electrical input power rating stamped on a fan assembly nameplate.

FAN SYSTEM BHP. The sum of the fan brake horsepower of all fans that are required to operate at fan system design conditions to supply air from the heating or cooling source to the *conditioned spaces* and return it to the source or exhaust it to the outdoors.

FAN SYSTEM DESIGN CONDITIONS. Operating conditions that can be expected to occur during normal system operation that result in the highest supply fan airflow rate to conditioned spaces served by the system, other than during air economizer operation.

FAN SYSTEM ELECTRICAL INPUT POWER. The sum of the fan electrical power of all fans that are required to operate at fan system design conditions to supply air from the heating or cooling source to the conditioned spaces and/or return it to the source or exhaust it to the outdoors.

FAN SYSTEM MOTOR NAMEPLATE HP. The sum of the motor nameplate horsepower of all fans that are required to operate at design conditions to supply air from the heating or cooling source to the *conditioned spaces* and return it to the source or exhaust it to the outdoors.

FAULT DETECTION AND DIAGNOSTICS (FDD) SYSTEM. A software platform that utilizes building analytic algorithms to convert data provided by sensors and devices to automatically identify faults in building systems and provide a prioritized list of actionable resolutions to those faults based on cost or energy avoidance, comfort and maintenance impact.

FENESTRATION. Products classified as either skylights or vertical fenestration.

Skylights. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal, including unit skylights, tubular daylighting devices and glazing materials in solariums, sunrooms, roofs, greenhouses and sloped walls.

Vertical fenestration. Windows that are fixed or operable, opaque doors, glazed doors, glazed block and combination opaque and glazed doors composed of glass

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or other transparent or translucent glazing materials and installed at a slope of not less than 60 degrees (1.05 rad) from horizontal.

FENESTRATION PRODUCT, FIELD-FABRICATED. A fenestration product whose frame is made at the construction site of standard dimensional lumber or other materials that were not previously cut or otherwise formed with the specific intention of being used to fabricate a fenestration product or exterior door. Field-fabricated does not include site-built fenestration.

FENESTRATION PRODUCT, SITE-BUILT. A fenestration designed to be made up of field-glazed or field-assembled units using specific factory cut or otherwise factory-formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls and atrium roof systems.

***F*-FACTOR.** The perimeter heat loss factor for slab-on-grade floors (Btu/h × ft × °F) [W/(m × K)].

FLOOR AREA, NET. The actual occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical rooms and closets.

GENERAL LIGHTING. Interior lighting that provides a substantially uniform level of illumination throughout a space.

GREENHOUSE. A structure or a thermally isolated area of a building that maintains a specialized sunlit environment exclusively used for, and essential to, the cultivation, protection or maintenance of plants. *Greenhouses* are those that are erected for a period of 180 days or more.

GROUP R. Buildings or portions of buildings that contain any of the following occupancies as established in the *International Building Code*:

1. *Group R*-1.
2. *Group R*-2 where located more than three stories in height above grade plane.
3. *Group R*-4 where located more than three stories in height above grade plane.

HEAT TRAP. An arrangement of piping and fittings, such as elbows, or a commercially available heat trap that prevents thermosyphoning of hot water during standby periods.

HEATED SLAB. Slab-on-grade construction in which the heating elements, hydronic tubing or hot air distribution system is in contact with, or placed within or under, the slab.

HIGH SPEED DOOR. A nonswinging door used primarily to facilitate vehicular access or material transportation, with a minimum opening rate of 32 inches (813 mm) per second, a minimum closing rate of 24 inches (610 mm) per second and that includes an automatic-closing device.

HISTORIC BUILDING. Any building or structure that is one or more of the following:

1. Listed, or certified as eligible for listing, by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.
2. Designated as historic under an applicable state or local law.
3. Certified as a contributing resource within a National Register-listed, state-designated or locally designated historic district.

IEC DESIGN H MOTOR. An electric motor that meets all of the following:

1. It is an induction motor designed for use with three-phase power.
2. It contains a cage rotor.
3. It is capable of direct-on-line starting.
4. It has four, six or eight poles.
5. It is rated from 0.4 kW to 1600 kW at a frequency of 60 hertz.

IEC DESIGN N MOTOR. An electric motor that meets all of the following:

1. It is an induction motor designed for use with three-phase power.
2. It contains a cage rotor.
3. It is capable of direct-on-line starting.
4. It has two, four, six or eight poles.
5. It is rated from 0.4 kW to 1600 kW at a frequency of 60 hertz.

INFILTRATION. The uncontrolled inward air leakage into a building caused by the pressure effects of wind or the effect of differences in the indoor and outdoor air density or both.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). Items including computers, data storage devices, servers and network and communication equipment.

INTEGRATED PART LOAD VALUE (IPLV). A single-number figure of merit based on part-load EER, COP or kW/ton expressing part-load efficiency for air-conditioning and heat pump equipment on the basis of weighted operation at various load capacities for equipment.

INTERNAL CURTAIN SYSTEM. A system consisting of movable panels of fabric or plastic film used to cover and uncover the space enclosed in a *greenhouse* on a daily basis.

ISOLATION DEVICES. Devices that isolate HVAC zones so that they can be operated independently of one another. *Isolation devices* include separate systems, isolation dampers and controls providing shutoff at terminal boxes.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, *approved agency* or other organization concerned with product evaluation that maintains periodic inspection of the production of the labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LARGE-DIAMETER CEILING FAN. A ceiling fan that is greater than 7 feet (2134 mm) in diameter. These fans are sometimes referred to as High-Volume, Low-Speed (HVLS) fans.

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LINER SYSTEM (Ls). A system that includes the following:

1. A continuous vapor barrier liner membrane that is installed below the purlins and that is uninterrupted by framing members.
2. An uncompressed, unfaced insulation resting on top of the liner membrane and located between the purlins.

For multilayer installations, the last rated *R*-value of insulation is for unfaced insulation draped over purlins and then compressed when the metal roof panels are attached.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the *code official* and concerned with evaluation of products or services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

LOW-SLOPED ROOF. A roof having a slope less than 2 units vertical in 12 units horizontal.

LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMER. A transformer that is air-cooled, does not use oil as a coolant, has an input voltage less than or equal to 600 volts and is rated for operation at a frequency of 60 hertz.

LUMINAIRE-LEVEL LIGHTING CONTROLS. A lighting system consisting of one or more luminaires with embedded lighting control logic, occupancy and ambient light sensors, wireless networking capabilities and local override switching capability, where required.

MANUAL. Capable of being operated by personal intervention (see "*Automatic*").

NAMEPLATE HORSEPOWER. The nominal motor output power rating stamped on the motor nameplate.

NEMA DESIGN A MOTOR. A squirrel-cage motor that meets all of the following:

1. It is designed to withstand full-voltage starting and develop locked-rotor torque as shown in paragraph 12.38.1 of NEMA MG 1.
2. It has pull-up torque not less than the values shown in paragraph 12.40.1 of NEMA MG 1.
3. It has breakdown torque not less than the values shown in paragraph 12.39.1 of NEMA MG 1.
4. It has a locked-rotor current higher than the values shown in paragraph 12.35.1 of NEMA MG 1 for 60 hertz and paragraph 12.35.2 of NEMA MG 1 for 50 hertz.
5. It has a slip at rated load of less than 5 percent for motors with fewer than 10 poles.

NEMA DESIGN B MOTOR. A squirrel-cage motor that meets all of the following:

1. It is designed to withstand full-voltage starting.
2. It develops locked-rotor, breakdown and pull-up torques adequate for general application as specified in Sections 12.38, 12.39 and 12.40 of NEMA MG1.
3. It draws locked-rotor current not to exceed the values shown in Section 12.35.1 for 60 hertz and Section 12.35.2 for 50 hertz of NEMA MG1.
4. It has a slip at rated load of less than 5 percent for motors with fewer than 10 poles.

NEMA DESIGN C MOTOR. A squirrel-cage motor that meets all of the following:

1. Designed to withstand full-voltage starting and develop locked-rotor torque for high-torque applications up to the values shown in paragraph 12.38.2 of NEMA MG1 (incorporated by reference, see A§431.15).
2. It has pull-up torque not less than the values shown in paragraph 12.40.2 of NEMA MG1.
3. It has breakdown torque not less than the values shown in paragraph 12.39.2 of NEMA MG1.
4. It has a locked-rotor current not to exceed the values shown in paragraph 12.35.1 of NEMA MG1 for 60 hertz and paragraph 12.35.2 for 50 hertz.
5. It has a slip at rated load of less than 5 percent.

NETWORKED GUESTROOM CONTROL SYSTEM. A control system, with access from the front desk or other central location associated with a *Group R*-1 building, that is capable of identifying the rented and unrented status of each guestroom according to a timed schedule, and is capable of controlling HVAC in each hotel and motel guestroom separately.

NONSTANDARD PART LOAD VALUE (NPLV). A single-number part-load efficiency figure of merit calculated and referenced to conditions other than IPLV conditions, for units that are not designed to operate at AHRI standard rating conditions.

OCCUPANT SENSOR CONTROL. An automatic control device or system that detects the presence or absence of people within an area and causes lighting, equipment or appliances to be regulated accordingly.

ON-SITE RENEWABLE ENERGY. Energy from renewable energy resources harvested at the building project site.

OPAQUE DOOR. A door that is not less than 50-percent opaque in surface area.

POWERED ROOF/WALL VENTILATORS. A fan consisting of a centrifugal or axial impeller with an integral driver in a weather-resistant housing and with a base designed to fit, usually by means of a curb, over a wall or roof opening.

PROPOSED DESIGN. A description of the proposed building used to estimate annual energy use for determining compliance based on total building performance.

RADIANT HEATING SYSTEM. A heating system that transfers heat to objects and surfaces within a conditioned space, primarily by infrared radiation.

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READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached without requiring the removal or movement of any panel or similar obstruction.

REFRIGERANT DEW POINT. The refrigerant vapor saturation temperature at a specified pressure.

REFRIGERATED WAREHOUSE COOLER. An enclosed storage space capable of being refrigerated to temperatures above 32°F (0°C) that can be walked into and has a total chilled storage area of not less than 3,000 square feet (279 m^2).

REFRIGERATED WAREHOUSE FREEZER. An enclosed storage space capable of being refrigerated to temperatures at or below 32°F (0°C) that can be walked into and has a total chilled storage area of not less than 3,000 square feet (279 m^2).

REFRIGERATION SYSTEM, LOW TEMPERATURE. Systems for maintaining food product in a frozen state in refrigeration applications.

REFRIGERATION SYSTEM, MEDIUM TEMPERATURE. Systems for maintaining food product above freezing in refrigeration applications.

REGISTERED DESIGN PROFESSIONAL. An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

RENEWABLE ENERGY RESOURCES. Energy derived from solar radiation, wind, waves, tides, landfill gas, biogas, biomass or extracted from hot fluid or steam heated within the earth.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage.

REROOFING. The process of recovering or replacing an existing roof covering. See "*Roof recover*" and "*Roof replacement*."

RESIDENTIAL BUILDING. For this code, includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) and *Group R*-2, R-3 and R-4 buildings three stories or less in height above grade plane.

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly includes the roof covering, underlayment, roof deck, insulation, vapor retarder and interior finish.

ROOF RECOVER. The process of installing an additional roof covering over an existing roof covering without removing the existing roof covering.

ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purpose of its maintenance.

ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

ROOFTOP MONITOR. A raised section of a roof containing vertical fenestration along one or more sides.

***R*-VALUE (THERMAL RESISTANCE).** The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area (h × ft^2 × °F/Btu) [(m^2 × K)/W].

SATURATED CONDENSING TEMPERATURE. The saturation temperature corresponding to the measured refrigerant pressure at the condenser inlet for single component and azeotropic refrigerants, and the arithmetic average of the dew point and *bubble point* temperatures corresponding to the refrigerant pressure at the condenser entrance for zeotropic refrigerants.

SERVICE WATER HEATING. Supply of hot water for purposes other than comfort heating.

SLEEPING UNIT. A room or space in which people sleep that can include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are part of a dwelling unit are not *sleeping units*.

SMALL ELECTRIC MOTOR. A general purpose alternating-current single-speed induction motor.

SOLAR HEAT GAIN COEFFICIENT (SHGC). The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation that is then reradiated, conducted or convected into the space.

STANDARD REFERENCE DESIGN. A version of the *proposed design* that meets the minimum requirements of this code and is used to determine the maximum annual energy use requirement for compliance based on total building performance.

STOREFRONT. A system of doors and windows mulled as a composite fenestration structure that has been designed to resist heavy use. *Storefront* systems include, but are not limited to, exterior fenestration systems that span from the floor level or above to the ceiling of the same story on commercial buildings, with or without mulled windows and doors.

TESTING UNIT ENCLOSURE AREA. The area sum of all the boundary surfaces that define the *dwelling unit*, *sleeping unit* or occupiable *conditioned space* including top/ceiling, bottom/floor and all side walls. This does not include interior partition walls within the *dwelling unit*, *sleeping unit*, or occupiable *conditioned space*. Wall height shall be measured from the finished floor of the *conditioned space* to the finished floor or roof/ceiling air barrier above.

THERMAL DISTRIBUTION EFFICIENCY (TDE). The resistance to changes in air heat as air is conveyed through a distance of air duct. TDE is a heat loss calculation evaluating the difference in the heat of the air between the air duct inlet and outlet caused by differences in temperatures between the air in the duct and the duct material. TDE is expressed as a percent difference between the inlet and outlet heat in the duct.

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THERMOSTAT. An automatic control device used to maintain temperature at a fixed or adjustable setpoint.

TIME SWITCH CONTROL. An automatic control device or system that controls lighting or other loads, including switching off, based on time schedules.

***U*-FACTOR (THERMAL TRANSMITTANCE).** The coefficient of heat transmission (air to air) through a building component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films (Btu/h × ft^2 × °F) [W/(m^2 × K)].

VARIABLE REFRIGERANT FLOW SYSTEM. An engineered direct-expansion (DX) refrigerant system that incorporates a common condensing unit, at least one variable-capacity compressor, a distributed refrigerant piping network to multiple indoor fan heating and cooling units each capable of individual zone temperature control, through integral zone temperature control devices and a common communications network. Variable refrigerant flow utilizes three or more steps of control on common interconnecting piping.

VEGETATIVE ROOF. An assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.

VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

VENTILATION AIR. That portion of supply air that comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

VISIBLE TRANSMITTANCE (VT). The ratio of visible light entering the space through the fenestration product assembly to the incident visible light. Visible transmittance includes the effects of glazing material and frame and is expressed as a number between 0 and 1.

VISIBLE TRANSMITTANCE, ANNUAL (VT_{annual}). The ratio of visible light entering the space through the fenestration product assembly to the incident visible light during the course of a year, which includes the effects of glazing material, frame, and light well or tubular conduit, and is expressed as a number between 0 and 1.

VOLTAGE DROP. A decrease in voltage caused by losses in the wiring systems that connect the power source to the load.

WALK-IN COOLER. An enclosed storage space capable of being refrigerated to temperatures above 32°F (0°C) and less than 55°F (12.8°C) that can be walked into, has a ceiling height of not less than 7 feet (2134 mm) and has a total chilled storage area of less than 3,000 square feet (279 m^2).

WALK-IN FREEZER. An enclosed storage space capable of being refrigerated to temperatures at or below 32°F (0°C) that can be walked into, has a ceiling height of not less than 7 feet (2134 mm) and has a total chilled storage area of less than 3,000 square feet (279 m^2).

WALL, ABOVE-GRADE. A wall associated with the *building thermal envelope* that is more than 15 percent above grade and is on the exterior of the building or any wall that is associated with the *building thermal envelope* that is not on the exterior of the building. This includes, but is not limited to, between-floor spandrels, peripheral edges of floors, roof knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and skylight shafts.

WALL, BELOW-GRADE. A wall associated with the basement or first story of the building that is part of the *building thermal envelope*, is not less than 85 percent below grade and is on the exterior of the building.

WATER HEATER. Any heating appliance or equipment that heats potable water and supplies such water to the potable hot water distribution system.

ZONE. A space or group of spaces within a building with heating or cooling requirements that are sufficiently similar so that desired conditions can be maintained throughout using a single controlling device.

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CHAPTER 3 [CE]
GENERAL REQUIREMENTS

User note:

About this chapter: *Chapter 3 addresses broadly applicable requirements that would not be at home in other chapters having more specific coverage of subject matter. This chapter establishes climate zone by US counties and territories and includes methodology for determining climate zones elsewhere. It also contains product rating, marking and installation requirements for materials such as insulation, windows, doors and siding.*

SECTION C301
CLIMATE ZONES

C301.1 General. *Climate zones* from Figure C301.1 or Table C301.1 shall be used for determining the applicable requirements from Chapter 4. Locations not indicated in Table C301.1 shall be assigned a *climate zone* in accordance with Section C301.3.

C301.2 Warm Humid counties. In Table C301.1, Warm Humid counties are identified by an asterisk.

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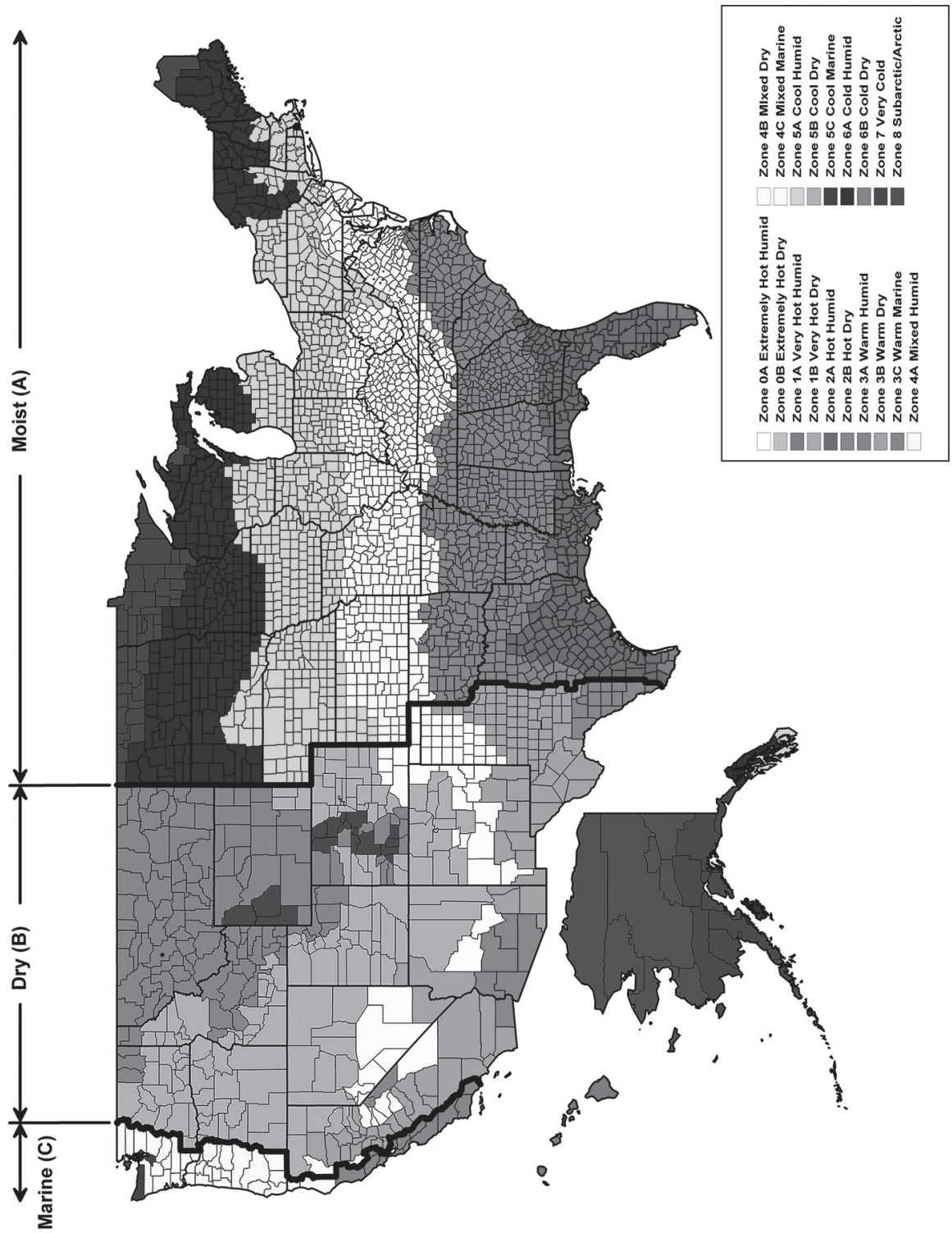


FIGURE C301.1
CLIMATE ZONES

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TABLE C301.1
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES
ALABAMA
3A Autauga*
2A Baldwin*
3A Barbour*
3A Bibb
3A Blount
3A Bullock*
3A Butler*
3A Calhoun
3A Chambers
3A Cherokee
3A Chilton
3A Choctaw*
3A Clarke*
3A Clay
3A Cleburne
2A Coffee*
3A Colbert
3A Conecuh*
3A Coosa
2A Covington*
3A Crenshaw*
3A Cullman
2A Dale*
3A Dallas*
3A DeKalb
3A Elmore*
2A Escambia*
3A Etowah
3A Fayette
3A Franklin
2A Geneva*
3A Greene
3A Hale
2A Henry*
2A Houston*
3A Jackson
3A Jefferson
3A Lamar
3A Lauderdale
3A Lawrence
3A Lee
3A Limestone
3A Lowndes*
3A Macon*
3A Madison
3A Marengo*
3A Marion
3A Marshall
2A Mobile*
3A Monroe*
3A Montgomery*
3A Morgan
3A Perry*
3A Pickens
3A Pike*
3A Randolph
3A Russell*
3A Shelby
3A St. Clair
3A Sumter
3A Talladega
3A Tallapoosa
3A Tuscaloosa
3A Walker
3A Washington*
3A Wilcox*
3A Winston
ALASKA
7 Aleutians East
7 Aleutians West
7 Anchorage
7 Bethel
7 Bristol Bay
8 Denali
7 Dillingham
8 Fairbanks North Star
6A Haines
6A Juneau
7 Kenai Peninsula
5C Ketchikan Gateway
6A Kodiak Island
7 Lake and Peninsula
7 Matanuska-Susitna
8 Nome
8 North Slope
8 Northwest Arctic

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ALASKA *(continued)*
5C Prince of Wales Outer Ketchikan
5C Sitka
6A Skagway-Hoonah-Angoon
8 Southeast Fairbanks
7 Valdez-Cordova
8 Wade Hampton
6A Wrangell-Petersburg
7 Yakutat
8 Yukon-Koyukuk
ARIZONA
5B Apache
3B Cochise
5B Coconino
4B Gila
3B Graham
3B Greenlee
2B La Paz
2B Maricopa
3B Mohave
5B Navajo
2B Pima
2B Pinal
3B Santa Cruz
4B Yavapai
2B Yuma
ARKANSAS
3A Arkansas
3A Ashley
4A Baxter
4A Benton
4A Boone
3A Bradley
3A Calhoun
4A Carroll
3A Chicot
3A Clark
3A Clay
3A Cleburne
3A Cleveland
3A Columbia*
3A Conway
3A Craighead
3A Crawford
3A Crittenden
3A Cross
3A Dallas
3A Desha
3A Drew
3A Faulkner
3A Franklin
4A Fulton
3A Garland
3A Grant
3A Greene
3A Hempstead*
3A Hot Spring
3A Howard
3A Independence
4A Izard
3A Jackson
3A Jefferson
3A Johnson
3A Lafayette*
3A Lawrence
3A Lee
3A Lincoln
3A Little River*
3A Logan
3A Lonoke
4A Madison
4A Marion
3A Miller*
3A Mississippi
3A Monroe
3A Montgomery
3A Nevada
4A Newton
3A Ouachita
3A Perry
3A Phillips
3A Pike
3A Poinsett
3A Polk
3A Pope
3A Prairie
3A Pulaski
3A Randolph

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ARKANSAS *(continued)*
3A Saline
3A Scott
4A Searcy
3A Sebastian
3A Sevier*
3A Sharp
3A St. Francis
4A Stone
3A Union*
3A Van Buren
4A Washington
3A White
3A Woodruff
3A Yell
CALIFORNIA
3C Alameda
6B Alpine
4B Amador
3B Butte
4B Calaveras
3B Colusa
3B Contra Costa
4C Del Norte
4B El Dorado
3B Fresno
3B Glenn
4C Humboldt
2B Imperial
4B Inyo
3B Kern
3B Kings
4B Lake
5B Lassen
3B Los Angeles
3B Madera
3C Marin
4B Mariposa
3C Mendocino
3B Merced
5B Modoc
6B Mono
3C Monterey
3C Napa
5B Nevada
3B Orange
3B Placer
5B Plumas
3B Riverside
3B Sacramento
3C San Benito
3B San Bernardino
3B San Diego
3C San Francisco
3B San Joaquin
3C San Luis Obispo
3C San Mateo
3C Santa Barbara
3C Santa Clara
3C Santa Cruz
3B Shasta
5B Sierra
5B Siskiyou
3B Solano
3C Sonoma
3B Stanislaus
3B Sutter
3B Tehama
4B Trinity
3B Tulare
4B Tuolumne
3C Ventura
3B Yolo
3B Yuba
COLORADO
5B Adams
6B Alamosa
5B Arapahoe
6B Archuleta
4B Baca
4B Bent
5B Boulder
5B Broomfield
6B Chaffee
5B Cheyenne
7 Clear Creek
6B Conejos
6B Costilla
5B Crowley

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
COLORADO *(continued)*
5B Custer
5B Delta
5B Denver
6B Dolores
5B Douglas
6B Eagle
5B Elbert
5B El Paso
5B Fremont
5B Garfield
5B Gilpin
7 Grand
7 Gunnison
7 Hinsdale
5B Huerfano
7 Jackson
5B Jefferson
5B Kiowa
5B Kit Carson
7 Lake
5B La Plata
5B Larimer
4B Las Animas
5B Lincoln
5B Logan
5B Mesa
7 Mineral
6B Moffat
5B Montezuma
5B Montrose
5B Morgan
4B Otero
6B Ouray
7 Park
5B Phillips
7 Pitkin
4B Prowers
5B Pueblo
6B Rio Blanco
7 Rio Grande
7 Routt
6B Saguache
7 San Juan
6B San Miguel
5B Sedgwick
7 Summit
5B Teller
5B Washington
5B Weld
5B Yuma
CONNECTICUT
5A (all)
DELAWARE
4A (all)
DISTRICT OF COLUMBIA
4A (all)
FLORIDA
2A Alachua*
2A Baker*
2A Bay*
2A Bradford*
2A Brevard*
1A Broward*
2A Calhoun*
2A Charlotte*
2A Citrus*
2A Clay*
2A Collier*
2A Columbia*
2A DeSoto*
2A Dixie*
2A Duval*
2A Escambia*
2A Flagler*
2A Franklin*
2A Gadsden*
2A Gilchrist*
2A Glades*
2A Gulf*
2A Hamilton*
2A Hardee*
2A Hendry*
2A Hernando*
2A Highlands*
2A Hillsborough*
2A Holmes*
2A Indian River*
2A Jackson*

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
FLORIDA *(continued)*
2A Jefferson*
2A Lafayette*
2A Lake*
2A Lee*
2A Leon*
2A Levy*
2A Liberty*
2A Madison*
2A Manatee*
2A Marion*
2A Martin*
1A Miami-Dade*
1A Monroe*
2A Nassau*
2A Okaloosa*
2A Okeechobee*
2A Orange*
2A Osceola*
1A Palm Beach*
2A Pasco*
2A Pinellas*
2A Polk*
2A Putnam*
2A Santa Rosa*
2A Sarasota*
2A Seminole*
2A St. Johns*
2A St. Lucie*
2A Sumter*
2A Suwannee*
2A Taylor*
2A Union*
2A Volusia*
2A Wakulla*
2A Walton*
2A Washington*
GEORGIA
2A Appling*
2A Atkinson*
2A Bacon*
2A Baker*
3A Baldwin
3A Banks
3A Barrow
3A Bartow
3A Ben Hill*
2A Berrien*
3A Bibb
3A Bleckley*
2A Brantley*
2A Brooks*
2A Bryan*
3A Bulloch*
3A Burke
3A Butts
2A Calhoun*
2A Camden*
3A Candler*
3A Carroll
3A Catoosa
2A Charlton*
2A Chatham*
3A Chattahoochee*
3A Chattooga
3A Cherokee
3A Clarke
3A Clay*
3A Clayton
2A Clinch*
3A Cobb
2A Coffee*
2A Colquitt*
3A Columbia
2A Cook*
3A Coweta
3A Crawford
3A Crisp*
3A Dade
3A Dawson
2A Decatur*
3A DeKalb
3A Dodge*
3A Dooly*
2A Dougherty*
3A Douglas
2A Early*
2A Echols*
2A Effingham*

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
GEORGIA *(continued)*
3A Elbert
3A Emanuel*
2A Evans*
3A Fannin
3A Fayette
3A Floyd
3A Forsyth
3A Franklin
3A Fulton
3A Gilmer
3A Glascock
2A Glynn*
3A Gordon
2A Grady*
3A Greene
3A Gwinnett
3A Habersham
3A Hall
3A Hancock
3A Haralson
3A Harris
3A Hart
3A Heard
3A Henry
3A Houston*
3A Irwin*
3A Jackson
3A Jasper
2A Jeff Davis*
3A Jefferson
3A Jenkins*
3A Johnson*
3A Jones
3A Lamar
2A Lanier*
3A Laurens*
3A Lee*
2A Liberty*
3A Lincoln
2A Long*
2A Lowndes*
3A Lumpkin
3A Macon*
3A Madison
3A Marion*
3A McDuffie
2A McIntosh*
3A Meriwether
2A Miller*
2A Mitchell*
3A Monroe
3A Montgomery*
3A Morgan
3A Murray
3A Muscogee
3A Newton
3A Oconee
3A Oglethorpe
3A Paulding
3A Peach*
3A Pickens
2A Pierce*
3A Pike
3A Polk
3A Pulaski*
3A Putnam
3A Quitman*
3A Rabun
3A Randolph*
3A Richmond
3A Rockdale
3A Schley*
3A Screven*
2A Seminole*
3A Spalding
3A Stephens
3A Stewart*
3A Sumter*
3A Talbot
3A Taliaferro
2A Tattnall*
3A Taylor*
3A Telfair*
3A Terrell*
2A Thomas*
2A Tift*
2A Toombs*
3A Towns

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
GEORGIA *(continued)*
3A Treutlen*
3A Troup
3A Turner*
3A Twiggs*
3A Union
3A Upson
3A Walker
3A Walton
2A Ware*
3A Warren
3A Washington
2A Wayne*
3A Webster*
3A Wheeler*
3A White
3A Whitfield
3A Wilcox*
3A Wilkes
3A Wilkinson
2A Worth*
HAWAII
1A (all)*
IDAHO
5B Ada
6B Adams
6B Bannock
6B Bear Lake
5B Benewah
6B Bingham
6B Blaine
6B Boise
6B Bonner
6B Bonneville
6B Boundary
6B Butte
6B Camas
5B Canyon
6B Caribou
5B Cassia
6B Clark
5B Clearwater
6B Custer
5B Elmore
6B Franklin
6B Fremont
5B Gem
5B Gooding
5B Idaho
6B Jefferson
5B Jerome
5B Kootenai
5B Latah
6B Lemhi
5B Lewis
5B Lincoln
6B Madison
5B Minidoka
5B Nez Perce
6B Oneida
5B Owyhee
5B Payette
5B Power
5B Shoshone
6B Teton
5B Twin Falls
6B Valley
5B Washington
ILLINOIS
5A Adams
4A Alexander
4A Bond
5A Boone
5A Brown
5A Bureau
4A Calhoun
5A Carroll
5A Cass
5A Champaign
4A Christian
4A Clark
4A Clay
4A Clinton
4A Coles
5A Cook
4A Crawford
4A Cumberland
5A DeKalb
5A De Witt

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ILLINOIS *(continued)*
5A Douglas
5A DuPage
5A Edgar
4A Edwards
4A Effingham
4A Fayette
5A Ford
4A Franklin
5A Fulton
4A Gallatin
4A Greene
5A Grundy
4A Hamilton
5A Hancock
4A Hardin
5A Henderson
5A Henry
5A Iroquois
4A Jackson
4A Jasper
4A Jefferson
4A Jersey
5A Jo Daviess
4A Johnson
5A Kane
5A Kankakee
5A Kendall
5A Knox
5A Lake
5A La Salle
4A Lawrence
5A Lee
5A Livingston
5A Logan
5A Macon
4A Macoupin
4A Madison
4A Marion
5A Marshall
5A Mason
4A Massac
5A McDonough
5A McHenry
5A McLean
5A Menard
5A Mercer
4A Monroe
4A Montgomery
5A Morgan
5A Moultrie
5A Ogle
5A Peoria
4A Perry
5A Piatt
5A Pike
4A Pope
4A Pulaski
5A Putnam
4A Randolph
4A Richland
5A Rock Island
4A Saline
5A Sangamon
5A Schuyler
5A Scott
4A Shelby
5A Stark
4A St. Clair
5A Stephenson
5A Tazewell
4A Union
5A Vermilion
4A Wabash
5A Warren
4A Washington
4A Wayne
4A White
5A Whiteside
5A Will
4A Williamson
5A Winnebago
5A Woodford
INDIANA
5A Adams
5A Allen
4A Bartholomew
5A Benton
5A Blackford
5A Boone
4A Brown

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
INDIANA *(continued)*
5A Carroll
5A Cass
4A Clark
4A Clay
5A Clinton
4A Crawford
4A Daviess
4A Dearborn
4A Decatur
5A De Kalb
5A Delaware
4A Dubois
5A Elkhart
4A Fayette
4A Floyd
5A Fountain
4A Franklin
5A Fulton
4A Gibson
5A Grant
4A Greene
5A Hamilton
5A Hancock
4A Harrison
4A Hendricks
5A Henry
5A Howard
5A Huntington
4A Jackson
5A Jasper
5A Jay
4A Jefferson
4A Jennings
4A Johnson
4A Knox
5A Kosciusko
5A LaGrange
5A Lake
5A LaPorte
4A Lawrence
5A Madison
4A Marion
5A Marshall
4A Martin
5A Miami
4A Monroe
5A Montgomery
4A Morgan
5A Newton
5A Noble
4A Ohio
4A Orange
4A Owen
5A Parke
4A Perry
4A Pike
5A Porter
4A Posey
5A Pulaski
4A Putnam
5A Randolph
4A Ripley
4A Rush
4A Scott
4A Shelby
4A Spencer
5A Starke
5A Steuben
5A St. Joseph
4A Sullivan
4A Switzerland
5A Tippecanoe
5A Tipton
4A Union
4A Vanderburgh
5A Vermillion
4A Vigo
5A Wabash
5A Warren
4A Warrick
4A Washington
5A Wayne
5A Wells
5A White
5A Whitley
IOWA
5A Adair
5A Adams

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
IOWA *(continued)*
5A Allamakee
5A Appanoose
5A Audubon
5A Benton
6A Black Hawk
5A Boone
5A Bremer
5A Buchanan
5A Buena Vista
5A Butler
5A Calhoun
5A Carroll
5A Cass
5A Cedar
6A Cerro Gordo
5A Cherokee
5A Chickasaw
5A Clarke
6A Clay
5A Clayton
5A Clinton
5A Crawford
5A Dallas
5A Davis
5A Decatur
5A Delaware
5A Des Moines
6A Dickinson
5A Dubuque
6A Emmet
5A Fayette
5A Floyd
5A Franklin
5A Fremont
5A Greene
5A Grundy
5A Guthrie
5A Hamilton
6A Hancock
5A Hardin
5A Harrison
5A Henry
5A Howard
5A Humboldt
5A Ida
5A Iowa
5A Jackson
5A Jasper
5A Jefferson
5A Johnson
5A Jones
5A Keokuk
6A Kossuth
5A Lee
5A Linn
5A Louisa
5A Lucas
6A Lyon
5A Madison
5A Mahaska
5A Marion
5A Marshall
5A Mills
6A Mitchell
5A Monona
5A Monroe
5A Montgomery
5A Muscatine
6A O'Brien
6A Osceola
5A Page
6A Palo Alto
5A Plymouth
5A Pocahontas
5A Polk
5A Pottawattamie
5A Poweshiek
5A Ringgold
5A Sac
5A Scott
5A Shelby
6A Sioux
5A Story
5A Tama
5A Taylor
5A Union
5A Van Buren
5A Wapello

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
IOWA *(continued)*
5A Warren
5A Washington
5A Wayne
5A Webster
6A Winnebago
5A Winneshiek
5A Woodbury
6A Worth
5A Wright
KANSAS
4A Allen
4A Anderson
4A Atchison
4A Barber
4A Barton
4A Bourbon
4A Brown
4A Butler
4A Chase
4A Chautauqua
4A Cherokee
5A Cheyenne
4A Clark
4A Clay
4A Cloud
4A Coffey
4A Comanche
4A Cowley
4A Crawford
5A Decatur
4A Dickinson
4A Doniphan
4A Douglas
4A Edwards
4A Elk
4A Ellis
4A Ellsworth
4A Finney
4A Ford
4A Franklin
4A Geary
5A Gove
4A Graham
4A Grant
4A Gray
5A Greeley
4A Greenwood
4A Hamilton
4A Harper
4A Harvey
4A Haskell
4A Hodgeman
4A Jackson
4A Jefferson
5A Jewell
4A Johnson
4A Kearny
4A Kingman
4A Kiowa
4A Labette
4A Lane
4A Leavenworth
4A Lincoln
4A Linn
5A Logan
4A Lyon
4A Marion
4A Marshall
4A McPherson
4A Meade
4A Miami
4A Mitchell
4A Montgomery
4A Morris
4A Morton
4A Nemaha
4A Neosho
4A Ness
5A Norton
4A Osage
4A Osborne
4A Ottawa
4A Pawnee
5A Phillips
4A Pottawatomie
4A Pratt
5A Rawlins
4A Reno

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
KANSAS *(continued)*
5A Republic
4A Rice
4A Riley
4A Rooks
4A Rush
4A Russell
4A Saline
5A Scott
4A Sedgwick
4A Seward
4A Shawnee
5A Sheridan
5A Sherman
5A Smith
4A Stafford
4A Stanton
4A Stevens
4A Sumner
5A Thomas
4A Trego
4A Wabaunsee
5A Wallace
4A Washington
5A Wichita
4A Wilson
4A Woodson
4A Wyandotte
KENTUCKY
4A (all)
LOUISIANA
2A Acadia*
2A Allen*
2A Ascension*
2A Assumption*
2A Avoyelles*
2A Beauregard*
3A Bienville*
3A Bossier*
3A Caddo*
2A Calcasieu*
3A Caldwell*
2A Cameron*
3A Catahoula*
3A Claiborne*
3A Concordia*
3A De Soto*
2A East Baton Rouge*
3A East Carroll
2A East Feliciana*
2A Evangeline*
3A Franklin*
3A Grant*
2A Iberia*
2A Iberville*
3A Jackson*
2A Jefferson*
2A Jefferson Davis*
2A Lafayette*
2A Lafourche*
3A La Salle*
3A Lincoln*
2A Livingston*
3A Madison*
3A Morehouse
3A Natchitoches*
2A Orleans*
3A Ouachita*
2A Plaquemines*
2A Pointe Coupee*
2A Rapides*
3A Red River*
3A Richland*
3A Sabine*
2A St. Bernard*
2A St. Charles*
2A St. Helena*
2A St. James*
2A St. John the Baptist*
2A St. Landry*
2A St. Martin*
2A St. Mary*
2A St. Tammany*
2A Tangipahoa*
3A Tensas*
2A Terrebonne*
3A Union*
2A Vermilion*
3A Vernon*

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
LOUISIANA *(continued)*
2A Washington*
3A Webster*
2A West Baton Rouge*
3A West Carroll
2A West Feliciana*
3A Winn*
MAINE
6A Androscoggin
7 Aroostook
6A Cumberland
6A Franklin
6A Hancock
6A Kennebec
6A Knox
6A Lincoln
6A Oxford
6A Penobscot
6A Piscataquis
6A Sagadahoc
6A Somerset
6A Waldo
6A Washington
6A York
MARYLAND
5A Allegany
4A Anne Arundel
4A Baltimore
4A Baltimore (city)
4A Calvert
4A Caroline
4A Carroll
4A Cecil
4A Charles
4A Dorchester
4A Frederick
5A Garrett
4A Harford
4A Howard
4A Kent
4A Montgomery
4A Prince George's
4A Queen Anne's
4A Somerset
4A St. Mary's
4A Talbot
4A Washington
4A Wicomico
4A Worcester
MASSACHUSETTS
5A (all)
MICHIGAN
6A Alcona
6A Alger
5A Allegan
6A Alpena
6A Antrim
6A Arenac
6A Baraga
5A Barry
5A Bay
6A Benzie
5A Berrien
5A Branch
5A Calhoun
5A Cass
6A Charlevoix
6A Cheboygan
6A Chippewa
6A Clare
5A Clinton
6A Crawford
6A Delta
6A Dickinson
5A Eaton
6A Emmet
5A Genesee
6A Gladwin
6A Gogebic
6A Grand Traverse
5A Gratiot
5A Hillsdale
6A Houghton
5A Huron
5A Ingham
5A Ionia
6A Iosco
6A Iron
6A Isabella

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MICHIGAN *(continued)*
5A Jackson
5A Kalamazoo
6A Kalkaska
5A Kent
7 Keweenaw
6A Lake
5A Lapeer
6A Leelanau
5A Lenawee
5A Livingston
6A Luce
6A Mackinac
5A Macomb
6A Manistee
7 Marquette
6A Mason
6A Mecosta
6A Menominee
5A Midland
6A Missaukee
5A Monroe
5A Montcalm
6A Montmorency
5A Muskegon
6A Newaygo
5A Oakland
6A Oceana
6A Ogemaw
6A Ontonagon
6A Osceola
6A Oscoda
6A Otsego
5A Ottawa
6A Presque Isle
6A Roscommon
5A Saginaw
5A Sanilac
6A Schoolcraft
5A Shiawassee
5A St. Clair
5A St. Joseph
5A Tuscola
5A Van Buren
5A Washtenaw
5A Wayne
6A Wexford
MINNESOTA
7 Aitkin
6A Anoka
6A Becker
7 Beltrami
6A Benton
6A Big Stone
6A Blue Earth
6A Brown
7 Carlton
6A Carver
7 Cass
6A Chippewa
6A Chisago
6A Clay
7 Clearwater
7 Cook
6A Cottonwood
7 Crow Wing
6A Dakota
6A Dodge
6A Douglas
6A Faribault
5A Fillmore
6A Freeborn
6A Goodhue
6A Grant
6A Hennepin
5A Houston
7 Hubbard
6A Isanti
7 Itasca
6A Jackson
6A Kanabec
6A Kandiyohi
7 Kittson
7 Koochiching
6A Lac qui Parle
7 Lake
7 Lake of the Woods
6A Le Sueur
6A Lincoln

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MINNESOTA *(continued)*
6A Lyon
7 Mahnomen
7 Marshall
6A Martin
6A McLeod
6A Meeker
6A Mille Lacs
6A Morrison
6A Mower
6A Murray
6A Nicollet
6A Nobles
7 Norman
6A Olmsted
6A Otter Tail
7 Pennington
7 Pine
6A Pipestone
7 Polk
6A Pope
6A Ramsey
7 Red Lake
6A Redwood
6A Renville
6A Rice
6A Rock
7 Roseau
6A Scott
6A Sherburne
6A Sibley
6A Stearns
6A Steele
6A Stevens
7 St. Louis
6A Swift
6A Todd
6A Traverse
6A Wabasha
7 Wadena
6A Waseca
6A Washington
6A Watonwan
6A Wilkin
5A Winona
6A Wright
6A Yellow Medicine
MISSISSIPPI
3A Adams*
3A Alcorn
3A Amite*
3A Attala
3A Benton
3A Bolivar
3A Calhoun
3A Carroll
3A Chickasaw
3A Choctaw
3A Claiborne*
3A Clarke
3A Clay
3A Coahoma
3A Copiah*
3A Covington*
3A DeSoto
3A Forrest*
3A Franklin*
2A George*
3A Greene*
3A Grenada
2A Hancock*
2A Harrison*
3A Hinds*
3A Holmes
3A Humphreys
3A Issaquena
3A Itawamba
2A Jackson*
3A Jasper
3A Jefferson*
3A Jefferson Davis*
3A Jones*
3A Kemper
3A Lafayette
3A Lamar*
3A Lauderdale
3A Lawrence*
3A Leake
3A Lee

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MISSISSIPPI *(continued)*
3A Leflore
3A Lincoln*
3A Lowndes
3A Madison
3A Marion*
3A Marshall
3A Monroe
3A Montgomery
3A Neshoba
3A Newton
3A Noxubee
3A Oktibbeha
3A Panola
2A Pearl River*
3A Perry*
3A Pike*
3A Pontotoc
3A Prentiss
3A Quitman
3A Rankin*
3A Scott
3A Sharkey
3A Simpson*
3A Smith*
2A Stone*
3A Sunflower
3A Tallahatchie
3A Tate
3A Tippah
3A Tishomingo
3A Tunica
3A Union
3A Walthall*
3A Warren*
3A Washington
3A Wayne*
3A Webster
3A Wilkinson*
3A Winston
3A Yalobusha
3A Yazoo
MISSOURI
5A Adair
5A Andrew
5A Atchison
4A Audrain
4A Barry
4A Barton
4A Bates
4A Benton
4A Bollinger
4A Boone
4A Buchanan
4A Butler
4A Caldwell
4A Callaway
4A Camden
4A Cape Girardeau
4A Carroll
4A Carter
4A Cass
4A Cedar
4A Chariton
4A Christian
5A Clark
4A Clay
4A Clinton
4A Cole
4A Cooper
4A Crawford
4A Dade
4A Dallas
5A Daviess
5A DeKalb
4A Dent
4A Douglas
3A Dunklin
4A Franklin
4A Gasconade
5A Gentry
4A Greene
5A Grundy
5A Harrison
4A Henry
4A Hickory
5A Holt
4A Howard
4A Howell

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MISSOURI *(continued)*
4A Iron
4A Jackson
4A Jasper
4A Jefferson
4A Johnson
5A Knox
4A Laclede
4A Lafayette
4A Lawrence
5A Lewis
4A Lincoln
5A Linn
5A Livingston
5A Macon
4A Madison
4A Maries
5A Marion
4A McDonald
5A Mercer
4A Miller
4A Mississippi
4A Moniteau
4A Monroe
4A Montgomery
4A Morgan
4A New Madrid
4A Newton
5A Nodaway
4A Oregon
4A Osage
4A Ozark
3A Pemiscot
4A Perry
4A Pettis
4A Phelps
5A Pike
4A Platte
4A Polk
4A Pulaski
5A Putnam
5A Ralls
4A Randolph
4A Ray
4A Reynolds
4A Ripley
4A Saline
5A Schuyler
5A Scotland
4A Scott
4A Shannon
5A Shelby
4A St. Charles
4A St. Clair
4A St. Francois
4A St. Louis
4A St. Louis (city)
4A Ste. Genevieve
4A Stoddard
4A Stone
5A Sullivan
4A Taney
4A Texas
4A Vernon
4A Warren
4A Washington
4A Wayne
4A Webster
5A Worth
4A Wright
MONTANA
6B (all)
NEBRASKA
5A (all)
NEVADA
4B Carson City (city)
5B Churchill
3B Clark
4B Douglas
5B Elko
4B Esmeralda
5B Eureka
5B Humboldt
5B Lander
4B Lincoln
4B Lyon
4B Mineral
4B Nye
5B Pershing

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NEVADA *(continued)*
5B Storey
5B Washoe
5B White Pine
NEW HAMPSHIRE
6A Belknap
6A Carroll
5A Cheshire
6A Coos
6A Grafton
5A Hillsborough
5A Merrimack
5A Rockingham
5A Strafford
6A Sullivan
NEW JERSEY
4A Atlantic
5A Bergen
4A Burlington
4A Camden
4A Cape May
4A Cumberland
4A Essex
4A Gloucester
4A Hudson
5A Hunterdon
4A Mercer
4A Middlesex
4A Monmouth
5A Morris
4A Ocean
5A Passaic
4A Salem
5A Somerset
5A Sussex
4A Union
5A Warren
NEW MEXICO
4B Bernalillo
4B Catron
3B Chaves
4B Cibola
5B Colfax
4B Curry
4B DeBaca
3B Doña Ana
3B Eddy
4B Grant
4B Guadalupe
5B Harding
3B Hidalgo
3B Lea
4B Lincoln
5B Los Alamos
3B Luna
5B McKinley
5B Mora
3B Otero
4B Quay
5B Rio Arriba
4B Roosevelt
5B Sandoval
5B San Juan
5B San Miguel
5B Santa Fe
3B Sierra
4B Socorro
5B Taos
5B Torrance
4B Union
4B Valencia
NEW YORK
5A Albany
5A Allegany
4A Bronx
5A Broome
5A Cattaraugus
5A Cayuga
5A Chautauqua
5A Chemung
6A Chenango
6A Clinton
5A Columbia
5A Cortland
6A Delaware
5A Dutchess
5A Erie
6A Essex
6A Franklin

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NEW YORK *(continued)*
6A Fulton
5A Genesee
5A Greene
6A Hamilton
6A Herkimer
6A Jefferson
4A Kings
6A Lewis
5A Livingston
6A Madison
5A Monroe
6A Montgomery
4A Nassau
4A New York
5A Niagara
6A Oneida
5A Onondaga
5A Ontario
5A Orange
5A Orleans
5A Oswego
6A Otsego
5A Putnam
4A Queens
5A Rensselaer
4A Richmond
5A Rockland
5A Saratoga
5A Schenectady
5A Schoharie
5A Schuyler
5A Seneca
5A Steuben
6A St. Lawrence
4A Suffolk
6A Sullivan
5A Tioga
5A Tompkins
6A Ulster
6A Warren
5A Washington
5A Wayne
4A Westchester
5A Wyoming
5A Yates
NORTH CAROLINA
3A Alamance
3A Alexander
5A Alleghany
3A Anson
5A Ashe
5A Avery
3A Beaufort
3A Bertie
3A Bladen
3A Brunswick*
4A Buncombe
4A Burke
3A Cabarrus
4A Caldwell
3A Camden
3A Carteret*
3A Caswell
3A Catawba
3A Chatham
3A Cherokee
3A Chowan
3A Clay
3A Cleveland
3A Columbus*
3A Craven
3A Cumberland
3A Currituck
3A Dare
3A Davidson
3A Davie
3A Duplin
3A Durham
3A Edgecombe
3A Forsyth
3A Franklin
3A Gaston
3A Gates
4A Graham
3A Granville
3A Greene
3A Guilford
3A Halifax

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NORTH CAROLINA *(continued)*
3A Harnett
4A Haywood
4A Henderson
3A Hertford
3A Hoke
3A Hyde
3A Iredell
4A Jackson
3A Johnston
3A Jones
3A Lee
3A Lenoir
3A Lincoln
4A Macon
4A Madison
3A Martin
4A McDowell
3A Mecklenburg
4A Mitchell
3A Montgomery
3A Moore
3A Nash
3A New Hanover*
3A Northampton
3A Onslow*
3A Orange
3A Pamlico
3A Pasquotank
3A Pender*
3A Perquimans
3A Person
3A Pitt
3A Polk
3A Randolph
3A Richmond
3A Robeson
3A Rockingham
3A Rowan
3A Rutherford
3A Sampson
3A Scotland
3A Stanly
4A Stokes
4A Surry
4A Swain
4A Transylvania
3A Tyrrell
3A Union
3A Vance
3A Wake
3A Warren
3A Washington
5A Watauga
3A Wayne
3A Wilkes
3A Wilson
4A Yadkin
5A Yancey
NORTH DAKOTA
6A Adams
6A Barnes
7 Benson
6A Billings
7 Bottineau
6A Bowman
7 Burke
6A Burleigh
6A Cass
7 Cavalier
6A Dickey
7 Divide
6A Dunn
6A Eddy
6A Emmons
6A Foster
6A Golden Valley
7 Grand Forks
6A Grant
6A Griggs
6A Hettinger
6A Kidder
6A LaMoure
6A Logan
7 McHenry
6A McIntosh
6A McKenzie
6A McLean
6A Mercer

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NORTH DAKOTA *(continued)*
6A Morton
6A Mountrail
7 Nelson
6A Oliver
7 Pembina
7 Pierce
7 Ramsey
6A Ransom
7 Renville
6A Richland
7 Rolette
6A Sargent
6A Sheridan
6A Sioux
6A Slope
6A Stark
6A Steele
6A Stutsman
7 Towner
6A Traill
7 Walsh
7 Ward
6A Wells
6A Williams
OHIO
4A Adams
5A Allen
5A Ashland
5A Ashtabula
4A Athens
5A Auglaize
5A Belmont
4A Brown
4A Butler
5A Carroll
5A Champaign
5A Clark
4A Clermont
4A Clinton
5A Columbiana
5A Coshocton
5A Crawford
5A Cuyahoga
5A Darke
5A Defiance
5A Delaware
5A Erie
5A Fairfield
4A Fayette
4A Franklin
5A Fulton
4A Gallia
5A Geauga
4A Greene
5A Guernsey
4A Hamilton
5A Hancock
5A Hardin
5A Harrison
5A Henry
4A Highland
4A Hocking
5A Holmes
5A Huron
4A Jackson
5A Jefferson
5A Knox
5A Lake
4A Lawrence
5A Licking
5A Logan
5A Lorain
5A Lucas
4A Madison
5A Mahoning
5A Marion
5A Medina
4A Meigs
5A Mercer
5A Miami
5A Monroe
5A Montgomery
5A Morgan
5A Morrow
5A Muskingum
5A Noble
5A Ottawa
5A Paulding

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
OHIO *(continued)*
5A Perry
4A Pickaway
4A Pike
5A Portage
5A Preble
5A Putnam
5A Richland
4A Ross
5A Sandusky
4A Scioto
5A Seneca
5A Shelby
5A Stark
5A Summit
5A Trumbull
5A Tuscarawas
5A Union
5A Van Wert
4A Vinton
4A Warren
4A Washington
5A Wayne
5A Williams
5A Wood
5A Wyandot
OKLAHOMA
3A Adair
4A Alfalfa
3A Atoka
4B Beaver
3A Beckham
3A Blaine
3A Bryan
3A Caddo
3A Canadian
3A Carter
3A Cherokee
3A Choctaw
4B Cimarron
3A Cleveland
3A Coal
3A Comanche
3A Cotton
4A Craig
3A Creek
3A Custer
4A Delaware
3A Dewey
4A Ellis
4A Garfield
3A Garvin
3A Grady
4A Grant
3A Greer
3A Harmon
4A Harper
3A Haskell
3A Hughes
3A Jackson
3A Jefferson
3A Johnston
4A Kay
3A Kingfisher
3A Kiowa
3A Latimer
3A Le Flore
3A Lincoln
3A Logan
3A Love
4A Major
3A Marshall
3A Mayes
3A McClain
3A McCurtain
3A McIntosh
3A Murray
3A Muskogee
3A Noble
4A Nowata
3A Okfuskee
3A Oklahoma
3A Okmulgee
4A Osage
4A Ottawa
3A Pawnee
3A Payne
3A Pittsburg
3A Pontotoc

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
OKLAHOMA *(continued)*
3A Pottawatomie
3A Pushmataha
3A Roger Mills
3A Rogers
3A Seminole
3A Sequoyah
3A Stephens
4B Texas
3A Tillman
3A Tulsa
3A Wagoner
4A Washington
3A Washita
4A Woods
4A Woodward
OREGON
5B Baker
4C Benton
4C Clackamas
4C Clatsop
4C Columbia
4C Coos
5B Crook
4C Curry
5B Deschutes
4C Douglas
5B Gilliam
5B Grant
5B Harney
5B Hood River
4C Jackson
5B Jefferson
4C Josephine
5B Klamath
5B Lake
4C Lane
4C Lincoln
4C Linn
5B Malheur
4C Marion
5B Morrow
4C Multnomah
4C Polk
5B Sherman
4C Tillamook
5B Umatilla
5B Union
5B Wallowa
5B Wasco
4C Washington
5B Wheeler
4C Yamhill
PENNSYLVANIA
4A Adams
5A Allegheny
5A Armstrong
5A Beaver
5A Bedford
4A Berks
5A Blair
5A Bradford
4A Bucks
5A Butler
5A Cambria
5A Cameron
5A Carbon
5A Centre
4A Chester
5A Clarion
5A Clearfield
5A Clinton
5A Columbia
5A Crawford
4A Cumberland
4A Dauphin
4A Delaware
5A Elk
5A Erie
5A Fayette
5A Forest
4A Franklin
5A Fulton
5A Greene
5A Huntingdon
5A Indiana
5A Jefferson
5A Juniata
5A Lackawanna

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
PENNSYLVANIA *(continued)*
4A Lancaster
5A Lawrence
4A Lebanon
5A Lehigh
5A Luzerne
5A Lycoming
5A McKean
5A Mercer
5A Mifflin
5A Monroe
4A Montgomery
5A Montour
5A Northampton
5A Northumberland
4A Perry
4A Philadelphia
5A Pike
5A Potter
5A Schuylkill
5A Snyder
5A Somerset
5A Sullivan
5A Susquehanna
5A Tioga
5A Union
5A Venango
5A Warren
5A Washington
5A Wayne
5A Westmoreland
5A Wyoming
4A York
RHODE ISLAND
5A (all)
SOUTH CAROLINA
3A Abbeville
3A Aiken
3A Allendale*
3A Anderson
3A Bamberg*
3A Barnwell*
2A Beaufort*
3A Berkeley*
3A Calhoun
3A Charleston*
3A Cherokee
3A Chester
3A Chesterfield
3A Clarendon
3A Colleton*
3A Darlington
3A Dillon
3A Dorchester*
3A Edgefield
3A Fairfield
3A Florence
3A Georgetown*
3A Greenville
3A Greenwood
3A Hampton*
3A Horry*
2A Jasper*
3A Kershaw
3A Lancaster
3A Laurens
3A Lee
3A Lexington
3A Marion
3A Marlboro
3A McCormick
3A Newberry
3A Oconee
3A Orangeburg
3A Pickens
3A Richland
3A Saluda
3A Spartanburg
3A Sumter
3A Union
3A Williamsburg
3A York
SOUTH DAKOTA
6A Aurora
6A Beadle
5A Bennett
5A Bon Homme
6A Brookings
6A Brown

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
SOUTH DAKOTA *(continued)*
5A Brule
6A Buffalo
6A Butte
6A Campbell
5A Charles Mix
6A Clark
5A Clay
6A Codington
6A Corson
6A Custer
6A Davison
6A Day
6A Deuel
6A Dewey
5A Douglas
6A Edmunds
6A Fall River
6A Faulk
6A Grant
5A Gregory
5A Haakon
6A Hamlin
6A Hand
6A Hanson
6A Harding
6A Hughes
5A Hutchinson
6A Hyde
5A Jackson
6A Jerauld
5A Jones
6A Kingsbury
6A Lake
6A Lawrence
6A Lincoln
5A Lyman
6A Marshall
6A McCook
6A McPherson
6A Meade
5A Mellette
6A Miner
6A Minnehaha
6A Moody
6A Pennington
6A Perkins
6A Potter
6A Roberts
6A Sanborn
6A Shannon
6A Spink
5A Stanley
6A Sully
5A Todd
5A Tripp
6A Turner
5A Union
6A Walworth
5A Yankton
6A Ziebach
TENNESSEE
4A Anderson
3A Bedford
4A Benton
4A Bledsoe
4A Blount
4A Bradley
4A Campbell
4A Cannon
4A Carroll
4A Carter
4A Cheatham
3A Chester
4A Claiborne
4A Clay
4A Cocke
3A Coffee
3A Crockett
4A Cumberland
3A Davidson
3A Decatur
4A DeKalb
4A Dickson
3A Dyer
3A Fayette
4A Fentress
3A Franklin
3A Gibson

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TENNESSEE *(continued)*
3A Giles
4A Grainger
4A Greene
3A Grundy
4A Hamblen
3A Hamilton
4A Hancock
3A Hardeman
3A Hardin
4A Hawkins
3A Haywood
3A Henderson
4A Henry
3A Hickman
4A Houston
4A Humphreys
4A Jackson
4A Jefferson
4A Johnson
4A Knox
4A Lake
3A Lauderdale
3A Lawrence
3A Lewis
3A Lincoln
4A Loudon
4A Macon
3A Madison
3A Marion
3A Marshall
3A Maury
4A McMinn
3A McNairy
4A Meigs
4A Monroe
4A Montgomery
3A Moore
4A Morgan
4A Obion
4A Overton
3A Perry
4A Pickett
4A Polk
4A Putnam
4A Rhea
4A Roane
4A Robertson
3A Rutherford
4A Scott
4A Sequatchie
4A Sevier
3A Shelby
4A Smith
4A Stewart
4A Sullivan
4A Sumner
3A Tipton
4A Trousdale
4A Unicoi
4A Union
4A Van Buren
4A Warren
4A Washington
3A Wayne
4A Weakley
4A White
3A Williamson
4A Wilson
TEXAS
2A Anderson*
3B Andrews
2A Angelina*
2A Aransas*
3A Archer
4B Armstrong
2A Atascosa*
2A Austin*
4B Bailey
2B Bandera
2A Bastrop*
3B Baylor
2A Bee*
2A Bell*
2A Bexar*
3A Blanco*
3B Borden
2A Bosque*
3A Bowie*

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
2A Brazoria*
2A Brazos*
3B Brewster
4B Briscoe
2A Brooks*
3A Brown*
2A Burleson*
3A Burnet*
2A Caldwell*
2A Calhoun*
3B Callahan
1A Cameron*
3A Camp*
4B Carson
3A Cass*
4B Castro
2A Chambers*
2A Cherokee*
3B Childress
3A Clay
4B Cochran
3B Coke
3B Coleman
3A Collin*
3B Collingsworth
2A Colorado*
2A Comal*
3A Comanche*
3B Concho
3A Cooke
2A Coryell*
3B Cottle
3B Crane
3B Crockett
3B Crosby
3B Culberson
4B Dallam
2A Dallas*
3B Dawson
4B Deaf Smith
3A Delta
3A Denton*
2A DeWitt*
3B Dickens
2B Dimmit
4B Donley
2A Duval*
3A Eastland
3B Ector
2B Edwards
2A Ellis*
3B El Paso
3A Erath*
2A Falls*
3A Fannin
2A Fayette*
3B Fisher
4B Floyd
3B Foard
2A Fort Bend*
3A Franklin*
2A Freestone*
2B Frio
3B Gaines
2A Galveston*
3B Garza
3A Gillespie*
3B Glasscock
2A Goliad*
2A Gonzales*
4B Gray
3A Grayson
3A Gregg*
2A Grimes*
2A Guadalupe*
4B Hale
3B Hall
3A Hamilton*
4B Hansford
3B Hardeman
2A Hardin*
2A Harris*
3A Harrison*
4B Hartley
3B Haskell
2A Hays*
3B Hemphill
3A Henderson*

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
1A Hidalgo*
2A Hill*
4B Hockley
3A Hood*
3A Hopkins*
2A Houston*
3B Howard
3B Hudspeth
3A Hunt*
4B Hutchinson
3B Irion
3A Jack
2A Jackson*
2A Jasper*
3B Jeff Davis
2A Jefferson*
2A Jim Hogg*
2A Jim Wells*
2A Johnson*
3B Jones
2A Karnes*
3A Kaufman*
3A Kendall*
2A Kenedy*
3B Kent
3B Kerr
3B Kimble
3B King
2B Kinney
2A Kleberg*
3B Knox
3A Lamar*
4B Lamb
3A Lampasas*
2B La Salle
2A Lavaca*
2A Lee*
2A Leon*
2A Liberty*
2A Limestone*
4B Lipscomb
2A Live Oak*
3A Llano*
3B Loving
3B Lubbock
3B Lynn
2A Madison*
3A Marion*
3B Martin
3B Mason
2A Matagorda*
2B Maverick
3B McCulloch
2A McLennan*
2A McMullen*
2B Medina
3B Menard
3B Midland
2A Milam*
3A Mills*
3B Mitchell
3A Montague
2A Montgomery*
4B Moore
3A Morris*
3B Motley
3A Nacogdoches*
2A Navarro*
2A Newton*
3B Nolan
2A Nueces*
4B Ochiltree
4B Oldham
2A Orange*
3A Palo Pinto*
3A Panola*
3A Parker*
4B Parmer
3B Pecos
2A Polk*
4B Potter
3B Presidio
3A Rains*
4B Randall
3B Reagan
2B Real
3A Red River*
3B Reeves

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
2A Refugio*
4B Roberts
2A Robertson*
3A Rockwall*
3B Runnels
3A Rusk*
3A Sabine*
3A San Augustine*
2A San Jacinto*
2A San Patricio*
3A San Saba*
3B Schleicher
3B Scurry
3B Shackelford
3A Shelby*
4B Sherman
3A Smith*
3A Somervell*
2A Starr*
3A Stephens
3B Sterling
3B Stonewall
3B Sutton
4B Swisher
2A Tarrant*
3B Taylor
3B Terrell
3B Terry
3B Throckmorton
3A Titus*
3B Tom Green
2A Travis*
2A Trinity*
2A Tyler*
3A Upshur*
3B Upton
2B Uvalde
2B Val Verde
3A Van Zandt*
2A Victoria*
2A Walker*
2A Waller*
3B Ward
2A Washington*
2B Webb
2A Wharton*
3B Wheeler
3A Wichita
3B Wilbarger
1A Willacy*
2A Williamson*
2A Wilson*
3B Winkler
3A Wise
3A Wood*
4B Yoakum
3A Young
2B Zapata
2B Zavala
UTAH
5B Beaver
5B Box Elder
5B Cache
5B Carbon
6B Daggett
5B Davis
6B Duchesne
5B Emery
5B Garfield
5B Grand
5B Iron
5B Juab
5B Kane
5B Millard
6B Morgan
5B Piute
6B Rich
5B Salt Lake
5B San Juan
5B Sanpete
5B Sevier
6B Summit
5B Tooele
6B Uintah
5B Utah
6B Wasatch
3B Washington
5B Wayne

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
UTAH *(continued)*
5B Weber
VERMONT
6A (all)
VIRGINIA
4A (all except as follows:)
5A Alleghany
5A Bath
3A Brunswick
3A Chesapeake
5A Clifton Forge
5A Covington
3A Emporia
3A Franklin
3A Greensville
3A Halifax
3A Hampton
5A Highland
3A Isle of Wight
3A Mecklenburg
3A Newport News
3A Norfolk
3A Pittsylvania
3A Portsmouth
3A South Boston
3A Southampton
3A Suffolk
3A Surry
3A Sussex
3A Virginia Beach
WASHINGTON
5B Adams
5B Asotin
5B Benton
5B Chelan
5C Clallam
4C Clark
5B Columbia
4C Cowlitz
5B Douglas
6B Ferry
5B Franklin
5B Garfield
5B Grant
4C Grays Harbor
5C Island
4C Jefferson
4C King
5C Kitsap
5B Kittitas
5B Klickitat
4C Lewis
5B Lincoln
4C Mason
5B Okanogan
4C Pacific
6B Pend Oreille
4C Pierce
5C San Juan
4C Skagit
5B Skamania
4C Snohomish
5B Spokane
6B Stevens
4C Thurston
4C Wahkiakum
5B Walla Walla
4C Whatcom
5B Whitman
5B Yakima
WEST VIRGINIA
5A Barbour
4A Berkeley
4A Boone
4A Braxton
5A Brooke
4A Cabell
4A Calhoun
4A Clay
4A Doddridge
4A Fayette
4A Gilmer
5A Grant
4A Greenbrier
5A Hampshire
5A Hancock
5A Hardy
5A Harrison
4A Jackson

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued	
WEST VIRGINIA *(continued)*	6A Buffalo
4A Jefferson	6A Burnett
4A Kanawha	5A Calumet
4A Lewis	6A Chippewa
4A Lincoln	6A Clark
4A Logan	5A Columbia
5A Marion	5A Crawford
5A Marshall	5A Dane
4A Mason	5A Dodge
4A McDowell	6A Door
4A Mercer	6A Douglas
5A Mineral	6A Dunn
4A Mingo	6A Eau Claire
5A Monongalia	6A Florence
4A Monroe	5A Fond du Lac
4A Morgan	6A Forest
4A Nicholas	5A Grant
5A Ohio	5A Green
5A Pendleton	5A Green Lake
4A Pleasants	5A Iowa
5A Pocahontas	6A Iron
5A Preston	6A Jackson
4A Putnam	5A Jefferson
4A Raleigh	5A Juneau
5A Randolph	5A Kenosha
4A Ritchie	6A Kewaunee
4A Roane	5A La Crosse
4A Summers	5A Lafayette
5A Taylor	6A Langlade
5A Tucker	6A Lincoln
4A Tyler	6A Manitowoc
4A Upshur	6A Marathon
4A Wayne	6A Marinette
4A Webster	6A Marquette
5A Wetzel	6A Menominee
4A Wirt	5A Milwaukee
4A Wood	5A Monroe
4A Wyoming	6A Oconto
WISCONSIN	6A Oneida
5A Adams	5A Outagamie
6A Ashland	5A Ozaukee
6A Barron	6A Pepin
6A Bayfield	6A Pierce
6A Brown	6A Polk
	6A Portage

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
WISCONSIN *(continued)*
6A Price
5A Racine
5A Richland
5A Rock
6A Rusk
5A Sauk
6A Sawyer
6A Shawano
6A Sheboygan
6A St. Croix
6A Taylor
6A Trempealeau
5A Vernon
6AVilas
5A Walworth
6A Washburn
5A Washington
5A Waukesha
6A Waupaca
5A Waushara
5A Winnebago
6A Wood
WYOMING
6B Albany
6B Big Horn
6B Campbell
6B Carbon
6B Converse
6B Crook
6B Fremont
5B Goshen
6B Hot Springs
6B Johnson
5B Laramie
7 Lincoln
6B Natrona
6B Niobrara
6B Park
5B Platte
6B Sheridan
7 Sublette
6B Sweetwater
7 Teton
6B Uinta
6B Washakie
6B Weston
US TERRITORIES
AMERICAN SAMOA
1A (all)*
GUAM
1A (all)*
NORTHERN MARIANA ISLANDS
1A (all)*
PUERTO RICO
1A (all except as follows:)*
2B Barraquitas
2B Cayey
VIRGIN ISLANDS
1A (all)*

a. Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a Warm Humid location.

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C301.3 Climate zone definitions. To determine the climate zones for locations not listed in this code, use the following information to determine climate zone numbers and letters in accordance with Items 1 through 5.

1. Determine the thermal climate zone, 0 through 8, from Table C301.3 using the heating (HDD) and cooling degree-days (CDD) for the location.
2. Determine the moisture zone (Marine, Dry or Humid) in accordance with Items 2.1 through 2.3.
    2.1. If monthly average temperature and precipitation data are available, use the Marine, Dry and Humid definitions to determine the moisture zone (C, B or A).
    2.2. If annual average temperature information (including degree-days) and annual precipitation (i.e., annual mean) are available, use Items 2.2.1 through 2.2.3 to determine the moisture zone. If the moisture zone is not Marine, then use the Dry definition to determine whether Dry or Humid.
        2.2.1. If thermal climate zone is 3 and CDD50°F ≤ 4,500 (CDD10°C ≤ 2500), climate zone is Marine (3C).
        2.2.2. If thermal climate zone is 4 and CDD50°F ≤ 2,700 (CDD10°C ≤ 1500), climate zone is Marine (4C).
        2.2.3. If thermal climate zone is 5 and CDD50°F ≤ 1,800 (CDD10°C ≤ 1000), climate zone is Marine (5C).
    2.3. If only degree-day information is available, use Items 2.3.1 through 2.3.3 to determine the moisture zone. If the moisture zone is not Marine, then it is not possible to assign Humid or Dry moisture zone for this location.
        2.3.1. If thermal climate zone is 3 and CDD50°F ≤ 4,500 (CDD10°C ≤ 2500), climate zone is Marine (3C).
        2.3.2. If thermal climate zone is 4 and CDD50°F ≤ 2,700 (CDD10°C ≤ 1500), climate zone is Marine (4C).
        2.3.3. If thermal climate zone is 5 and CDD50°F ≤ 1,800 (CDD10°C ≤ 1000), climate zone is Marine (5C).
3. Marine (C) Zone definition: Locations meeting all the criteria in Items 3.1 through 3.4.
    3.1. Mean temperature of coldest month between 27°F (-3°C) and 65°F (18°C).
    3.2. Warmest month mean < 72°F (22°C).
    3.3. Not fewer than four months with mean temperatures over 50°F (10°C).
    3.4. Dry season in summer. The month with the heaviest precipitation in the cold season has at least three times as much precipitation as the month with the least precipitation in the rest of the year. The cold season is October through March in the Northern Hemisphere and April through September in the Southern Hemisphere.
4. Dry (B) definition: Locations meeting the criteria in Items 4.1 through 4.4.
    4.1. Not Marine (C).
    4.2. If 70 percent or more of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-1.

    $$P < 0.44 \times (T - 7)$$
    $$[P < 20.0 \times (T + 14) \text{ in SI units}]$$
    (Equation 3-1)

    where:
    P = Annual precipitation, inches (mm).
    T = Annual mean temperature, °F (°C).

    4.3. If between 30 and 70 percent of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-2.

    $$P < 0.44 \times (T - 19.5)$$
    $$[P < 20.0 \times (T + 7) \text{ in SI units}]$$
    (Equation 3-2)

    where:
    P = Annual precipitation, inches (mm).
    T = Annual mean temperature, °F (°C).

    4.4. If 30 percent or less of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-3.

    $$P < 0.44 \times (T - 32)$$
    $$[P < 20.0 \times T \text{ in SI units}]$$
    (Equation 3-3)

    where:
    P = Annual precipitation, inches (mm).
    T = Annual mean temperature, °F (°C).
5. Humid (A) definition: Locations that are not Marine (C) or Dry (B).

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TABLE C301.3
THERMAL CLIMATE ZONE DEFINITIONS

ZONE NUMBER	THERMAL CRITERIA	
	IP Units	SI Units
0	10,800 < CDD50°F	6000 < CDD10°C
1	9,000 < CDD50°F < 10,800	5000 < CDD10°C < 6000
2	6,300 < CDD50°F ≤ 9,000	3500 < CDD10°C ≤ 5000
3	CDD50°F ≤ 6,300 AND HDD65°F ≤ 3,600	CDD10°C < 3500 AND HDD18°C ≤ 2000
4	CDD50°F ≤ 6,300 AND 3,600 < HDD65°F ≤ 5,400	CDD10°C < 3500 AND 2000 < HDD18°C ≤ 3000
5	CDD50°F < 6,300 AND 5,400 < HDD65°F ≤ 7,200	CDD10°C < 3500 AND 3000 < HDD18°C ≤ 4000
6	7,200 < HDD65°F ≤ 9,000	4000 < HDD18°C ≤ 5000
7	9,000 < HDD65°F ≤ 12,600	5000 < HDD18°C ≤ 7000
8	12,600 < HDD65°F	7000 < HDD18°C

For SI: °C = [(°F) – 32]/1.8.

C301.4 Tropical climate region. The tropical climate region shall be defined as:

1. Hawaii, Puerto Rico, Guam, American Samoa, US Virgin Islands, Commonwealth of Northern Mariana Islands; and
2. Islands in the area between the Tropic of Cancer and the Tropic of Capricorn.

SECTION C302
DESIGN CONDITIONS

C302.1 Interior design conditions. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.

SECTION C303
MATERIALS, SYSTEMS AND EQUIPMENT

C303.1 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

C303.1.1 Building thermal envelope insulation. An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternatively, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown-in or sprayed fiberglass and cellulose insulation, the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be indicated on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and *R*-value of installed thickness shall be indicated on the certification. For insulated siding, the *R*-value shall be labeled on the product's package and shall be indicated on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

Exception: For roof insulation installed above the deck, the *R*-value shall be labeled as required by the material standards specified in Table 1508.2 of the *International Building Code*.

C303.1.1.1 Blown-in or sprayed roof/ceiling insulation. The thickness of blown-in or sprayed fiberglass and cellulose roof/ceiling insulation shall be written in inches (mm) on markers and one or more of such markers shall be installed for every 300 square feet (28 m^2) of attic area throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers not less than 1 inch (25 mm) in height. Each marker shall face the attic *access* opening. Spray polyurethane foam thickness and installed *R*-value shall be indicated on certification provided by the insulation installer.

C303.1.2 Insulation mark installation. Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection. For insulation materials that are installed without an observable manufacturer's *R*-value mark, such as blown or draped products, an insulation certificate complying with Section C303.1.1 shall be left immediately after installation by the installer, in a conspicuous location within the building, to certify the installed *R*-value of the insulation material.

C303.1.3 Fenestration product rating. *U*-factors of fenestration products shall be determined as follows:

1. For windows, doors and skylights, *U*-factor ratings shall be determined in accordance with NFRC 100.
2. Where required for garage doors and rolling doors, *U*-factor ratings shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

U-factors shall be determined by an accredited, independent laboratory, and *labeled* and certified by the manufacturer.

Products lacking such a *labeled U*-factor shall be assigned a default *U*-factor from Table C303.1.3(1) or Table C303.1.3(2). The *solar heat gain coefficient* (SHGC) and *visible transmittance* (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and *labeled* and certified by the manufacturer. Products lacking such a *labeled* SHGC or VT shall be assigned a default SHGC or VT from Table C303.1.3(3). For Tubular Daylighting Devices, VT_{annual} shall be measured and rated in accordance with NFRC 203.

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TABLE C303.1.3(1)
DEFAULT GLAZED WINDOW, GLASS DOOR AND SKYLIGHT *U*-FACTORS

FRAME TYPE	WINDOW AND GLASS DOOR		SKYLIGHT	
	Single	Double	Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

TABLE C303.1.3(2)
DEFAULT OPAQUE DOOR *U*-FACTORS

DOOR TYPE	OPAQUE *U*-FACTOR
Uninsulated Metal	1.20
Insulated Metal (Rolling)	0.90
Insulated Metal (Other)	0.60
Wood	0.50
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

TABLE C303.1.3(3)
DEFAULT GLAZED FENESTRATION SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

C303.1.4 Insulation product rating. The thermal resistance (*R*-value) of insulation shall be determined in accordance with the US Federal Trade Commission *R*-value rule (CFR Title 16, Part 460) in units of h × ft^2 × °F/Btu at a mean temperature of 75°F (24°C).

C303.1.4.1 Insulated siding. The thermal resistance (*R*-value) of insulated siding shall be determined in accordance with ASTM C1363. Installation for testing shall be in accordance with the manufacturer's instructions.

C303.2 Installation. Materials, systems and equipment shall be installed in accordance with the manufacturer's instructions and the *International Building Code*.

C303.2.1 Protection of exposed foundation insulation. Insulation applied to the exterior of basement walls, crawl space walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend not less than 6 inches (153 mm) below grade.

C303.2.2 Multiple layers of continuous insulation board. Where two or more layers of continuous insulation board are used in a construction assembly, the continuous insulation boards shall be installed in accordance with Section C303.2. Where the continuous insulation board manufacturer's instructions do not address installation of two or more layers, the edge joints between each layer of continuous insulation boards shall be staggered.

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CHAPTER 4 [CE]
COMMERCIAL ENERGY EFFICIENCY

User note:

About this chapter: *Chapter 4 presents the paths and options for compliance with the energy efficiency provisions. Chapter 4 contains energy efficiency provisions for the building envelope, mechanical and water heating systems, lighting and additional efficiency requirements. A performance alternative is also provided to allow for energy code compliance other than by the prescriptive method.*

SECTION C401
GENERAL

C401.1 Scope. The provisions in this chapter are applicable to commercial *buildings* and their *building sites*.

C401.2 Application. Commercial buildings shall comply with Section C401.2.1 or C401.2.2.

*

C401.2.1 International Energy Conservation Code. Commercial buildings shall comply with one of the following:

1. Prescriptive Compliance. The Prescriptive Compliance option requires compliance with Sections C402 through C406 and Section C408. Dwelling units and sleeping units in Group R-2 buildings without systems serving multiple units shall be deemed to be in compliance with this chapter, provided that they comply with Section R406.
2. Total Building Performance. The Total Building Performance option requires compliance with Section C407.

Exception: Additions, alterations, repairs and changes of occupancy to existing buildings complying with Chapter 5.

C401.2.2 ASHRAE 90.1. Commercial buildings shall comply with the requirements of ANSI/ASHRAE/IESNA 90.1.

C401.3 Thermal envelope certificate. A permanent thermal envelope certificate shall be completed by an *approved* party. Such certificate shall be posted on a wall in the space where the space conditioning equipment is located, a utility room or other *approved* location. If located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. A copy of the certificate shall also be included in the construction files for the project. The certificate shall include the following:

1. *R*-values of insulation installed in or on ceilings, roofs, walls, foundations and slabs, *basement walls*, crawl space walls and floors and ducts outside *conditioned spaces*.
2. *U*-factors and *solar heat gain coefficients* (SHGC) of fenestrations.
3. Results from any *building* envelope air leakage testing performed on the *building*.

Where there is more than one value for any component of the building envelope, the certificate shall indicate the area-weighted average value where available. If the area-weighted average is not available, the certificate shall list each value that applies to 10 percent or more of the total component area.

SECTION C402
BUILDING ENVELOPE REQUIREMENTS

C402.1 General. *Building thermal envelope* assemblies for buildings that are intended to comply with the code on a prescriptive basis in accordance with the compliance path described in Item 1 of Section C401.2.1 shall comply with the following:

1. The opaque portions of the *building thermal envelope* shall comply with the specific insulation requirements of Section C402.2 and the thermal requirements of either the *R*-value-based method of Section C402.1.3; the *U*-, *C*- and *F*-factor-based method of Section C402.1.4; or the component performance alternative of Section C402.1.5.
2. Roof solar reflectance and thermal emittance shall comply with Section C402.3.
3. Fenestration in building envelope assemblies shall comply with Section C402.4.
4. Air leakage of building envelope assemblies shall comply with Section C402.5.

Alternatively, where buildings have a vertical fenestration area or skylight area exceeding that allowed in Section C402.4, the building and *building thermal envelope* shall comply with Item 2 of Section C401.2.1 or Section C401.2.2.

Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with Section C403.11.

C402.1.1 Low-energy buildings and greenhouses. The following low-energy buildings, or portions thereof separated from the remainder of the building by *building thermal envelope* assemblies complying with this section, shall be exempt from the *building thermal envelope* provisions of Section C402.

1. Those with a peak design rate of energy usage less than 3.4 Btu/h × ft^2 (10.7 W/m^2) or 1.0 watt per

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square foot (10.7 W/m^2) of floor area for space conditioning purposes.

2. Those that do not contain *conditioned space*.

C402.1.1.1 Greenhouses. Greenhouse structures or areas that are mechanically heated or cooled and that comply with all of the following shall be exempt from the building envelope requirements of this code:

1. Exterior opaque envelope assemblies comply with Sections C402.2 and C402.4.5.

   Exception: Low energy greenhouses that comply with Section C402.1.1.

2. Interior partition *building thermal envelope* assemblies that separate the greenhouse from *conditioned space* comply with Sections C402.2, C402.4.3 and C402.4.5.
3. Fenestration assemblies that comply with the thermal envelope requirements in Table C402.1.1.1. The *U*-factor for a roof shall be for the roof assembly or a roof that includes the assembly and an *internal curtain system*.

   Exception: Unconditioned greenhouses.

TABLE C402.1.1.1
FENESTRATION THERMAL ENVELOPE MAXIMUM REQUIREMENTS

COMPONENT	*U*-FACTOR (BTU/h × ft^2 × °F)
Skylight	0.5
Vertical fenestration	0.7

C402.1.2 Equipment buildings. Buildings that comply with the following shall be exempt from the *building thermal envelope* provisions of this code:

1. Are separate buildings with floor area not more than 1,200 square feet (110 m^2).
2. Are intended to house electric equipment with installed equipment power totaling not less than 7 watts per square foot (75 W/m^2) and not intended for human occupancy.
3. Have a heating system capacity not greater than (17,000 Btu/hr) (5 kW) and a heating thermostat setpoint that is restricted to not more than 50°F (10°C).
4. Have an average wall and roof *U*-factor less than 0.200 in *Climate Zones* 1 through 5 and less than 0.120 in *Climate Zones* 6 through 8.
5. Comply with the roof solar reflectance and thermal emittance provisions for *Climate Zone* 1.

C402.1.3 Insulation component *R*-value-based method. *Building thermal envelope* opaque assemblies shall comply with the requirements of Sections C402.2 and C402.4 based on the *climate zone* specified in Chapter 3. For opaque portions of the *building thermal envelope* intended to comply on an insulation component *R*-value basis, the *R*-values for cavity insulation and continuous insulation shall be not less than that specified in Table C402.1.3. Where cavity insulation is installed in multiple layers, the cavity insulation *R*-values shall be summed to determine compliance with the cavity insulation *R*-value requirements. Where continuous insulation is installed in multiple layers, the continuous insulation *R*-values shall be summed to determine compliance with the continuous insulation *R*-value requirements. Cavity insulation *R*-values shall not be used to determine compliance with the continuous insulation *R*-value requirements in Table C402.1.3. Commercial buildings or portions of commercial buildings enclosing *Group R* occupancies shall use the *R*-values from the "*Group R*" column of Table C402.1.3. Commercial buildings or portions of commercial buildings enclosing occupancies other than *Group R* shall use the *R*-values from the "All other" column of Table C402.1.3.

C402.1.4 Assembly *U*-factor, *C*-factor or *F*-factor-based method. *Building thermal envelope* opaque assemblies shall meet the requirements of Sections C402.2 and C402.4 based on the climate zone specified in Chapter 3. *Building thermal envelope* opaque assemblies intended to comply on an assembly *U*-, *C*- or *F*-factor basis shall have a *U*-, *C*- or *F*-factor not greater than that specified in Table C402.1.4. Commercial buildings or portions of commercial buildings enclosing *Group R* occupancies shall use the *U*-, *C*- or *F*-factor from the "*Group R*" column of Table C402.1.4. Commercial buildings or portions of commercial buildings enclosing occupancies other than *Group R* shall use the *U*-, *C*- or *F*-factor from the "All other" column of Table C402.1.4

C402.1.4.1 Roof/ceiling assembly. The maximum roof/ceiling assembly *U*-factor shall not exceed that specified in Table C402.1.4 based on construction materials used in the roof/ceiling assembly.

C402.1.4.1.1 Tapered, above-deck insulation based on thickness. Where used as a component of a maximum roof/ceiling assembly *U*-factor calculation, the sloped roof insulation *R*-value contribution to that calculation shall use the average thickness in inches (mm) along with the material *R*-value-per-inch (per-mm) solely for *U*-factor compliance as prescribed in Section C402.1.4.

C402.1.4.1.2 Suspended ceilings. Insulation installed on suspended ceilings having removable ceiling tiles shall not be considered part of the assembly *U*-factor of the roof/ceiling construction.

C402.1.4.1.3 Joints staggered. Continuous insulation board shall be installed in not less than two layers, and the edge joints between each layer of insulation shall be staggered, except where insulation tapers to the roof deck at a gutter edge, roof drain or scupper.

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TABLE C402.1.3
OPAQUE THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, *R*-VALUE METHOD[a]

CLIMATE ZONE	0 AND 1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above roof deck	R-20ci	R-25ci	R-25ci	R-25ci	R-25ci	R-25ci	R-30ci	R-30ci	R-30ci	R-30ci	R-30ci	R-30ci	R-35ci	R-35ci	R-35ci	R-35ci
Metal buildings[b]	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-25 + R-11 LS	R-30 + R-11 LS	R-30 + R-11 LS	R-30 + R-11 LS	R-25 + R-11 + R-11 LS	R-25 + R-11 + R-11 LS
Attic and other	R-38	R-38	R-38	R-38	R-38	R-38	R-49	R-49	R-49	R-49	R-49	R-49	R-60	R-60	R-60	R-60
Walls, above grade																
Mass[f]	R-5.7ci[c]	R-5.7ci[c]	R-5.7ci[c]	R-7.6ci	R-7.6ci	R-9.5ci	R-9.5ci	R-11.4ci	R-11.4ci	R-13.3ci	R-13.3ci	R-15.2ci	R-15.2ci	R-15.2ci	R-25ci	R-25ci
Metal building	R-13 + R-6.5ci	R-13 + R-6.5ci	R13 + R-6.5ci	R-13 + R-13ci	R-13 + R-6.5ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-14ci	R-13 + R-14ci	R-13 + R-14ci	R-13 + R-14ci	R-13 + R-14ci	R-13 + R-17ci	R-13 + R-19.5ci	R-13 + R-19.5ci	R-13 + R-19.5ci
Metal framed	R-13 + R-5ci	R-13 + R-5ci	R-13 + R-5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-10ci	R-13 + R-10ci	R-13 + R-12.5ci	R-13 + R-12.5ci	R-13 + R-12.5ci	R-13 + R-15.6ci	R-13 + R-18.8ci	R-13 + R-18.8ci
Wood framed and other	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-7.5ci or R20 + R3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-18.8ci	R-13 + R-18.8ci
Walls, below grade																
Below-grade wall[d]	NR	NR	NR	NR	NR	NR	R-7.5ci	R-10ci	R-7.5ci	R-10ci	R-10ci	R-15ci	R-15ci	R-15ci	R-15ci	R-15ci
Floors																
Mass[e]	NR	NR	R-6.3ci	R-8.3ci	R-10ci	R-10ci	R-14.6ci	R-16.7ci	R-14.6ci	R-16.7ci	R-16.7ci	R-16.7ci	R-20.9ci	R-20.9ci	R-23ci	R-23ci
Joist/framing	R-13	R-13	R-30	R-30	R-30	R-30	R-30	R-30	R-30	R-30	R-38	R-38	R-38	R-38	R-38	R-38
Slab-on-grade floors																
Unheated slabs	NR	NR	NR	NR	NR	R-10 for 24″ below	R-15 for 24″ below	R-15 for 24″ below	R-15 for 24″ below	R-20 for 24″ below	R-20 for 24″ below	R-20 for 48″ below	R-20 for 24″ below	R-20 for 48″ below	R-20 for 48″ below	R-25 for 48″ below
Heated slabs[g]	R-7.5 for 12″ below+ R-5 full slab	R-7.5 for 12″ below+ R-5 full slab	R-7.5 for 12″ below+ R-5 full slab	R-7.5 for 12″ below+ R-5 full slab	R-10 for 24″ below+ R-5 full slab	R-10 for 24″ below+ R-5 full slab	R-15 for 24″ below+ R-5 full slab	R-15 for 24″ below+ R-5 full slab	R-15 for 36″ below+ R-5 full slab	R-15 for 36″ below+ R-5 full slab	R-15 for 36″ below+ R-5 full slab	R-20 for 48″ below+ R-5 full slab	R-20 for 48″ below+ R-5 full slab	R-20 for 48″ below+ R-5 full slab	R-20 for 48″ below+ R-5 full slab	R-20 for 48″ below+ R-5 full slab

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 4.88 kg/m^2, 1 pound per cubic foot = 16 kg/m^3.

ci = Continuous Insulation, NR = No Requirement, LS = Liner System.

a. Assembly descriptions can be found in ANSI/ASHRAE/IESNA 90.1 Appendix A.

b. Where using *R*-value compliance method, a thermal spacer block shall be provided, otherwise use the *U*-factor compliance method in Table C402.1.4.

c. R-5.7ci is allowed to be substituted with concrete block walls complying with ASTM C90, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with materials having a maximum thermal conductivity of 0.44 Btu-in/h-f^2 °F.

d. Where heated slabs are below grade, below-grade walls shall comply with the exterior insulation requirements for heated slabs.

e. "Mass floors" shall be in accordance with Section C402.2.3.

f. "Mass walls" shall be in accordance with Section C402.2.2.

g. The first value is for perimeter insulation and the second value is for full, under-slab insulation. Perimeter insulation is not required to extend below the bottom of the slab.

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TABLE C402.1.4
OPAQUE THERMAL ENVELOPE ASSEMBLY MAXIMUM REQUIREMENTS, *U*-FACTOR METHOD[a, b]

CLIMATE ZONE	0 AND 1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above roof deck	U-0.048	U-0.039	U-0.039	U-0.039	U-0.039	U-0.039	U-0.032	U-0.032	U-0.032	U-0.032	U-0.032	U-0.032	U-0.028	U-0.028	U-0.028	U-0.028
Metal buildings	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.031	U-0.029	U-0.029	U-0.029	U-0.026	U-0.026
Attic and other	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021	U-0.017	U-0.017	U-0.017	U-0.017
Walls, above grade																
Mass[f]	U-0.151	U-0.151	U-0.151	U-0.123	U-0.123	U-0.104	U-0.104	U-0.090	U-0.090	U-0.080	U-0.080	U-0.071	U-0.071	U-0.071	U-0.037	U-0.037
Metal building	U-0.079	U-0.079	U-0.079	U-0.079	U-0.079	U-0.052	U-0.052	U-0.050	U-0.050	U-0.050	U-0.050	U-0.050	U-0.044	U-0.039	U-0.039	U-0.039
Metal framed	U-0.077	U-0.077	U-0.077	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.055	U-0.055	U-0.049	U-0.049	U-0.049	U-0.042	U-0.037	U-0.037
Wood framed and other[c]	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.051	U-0.051	U-0.051	U-0.051	U-0.051	U-0.051	U-0.032	U-0.032
Walls, below grade																
Below-grade wall[c]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-0.119	C-0.092	C-0.119	C-0.092	C-0.092	C-0.063	C-0.063	C-0.063	C-0.063	C-0.063
Floors																
Mass[d]	U-0.322[e]	U-0.322[e]	U-0.107	U-0.087	U-0.074	U-0.074	U-0.057	U-0.051	U-0.057	U-0.051	U-0.051	U-0.051	U-0.042	U-0.042	U-0.038	U-0.038
Joist/framing	U-0.066[e]	U-0.066[e]	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027
Slab-on-grade floors																
Unheated slabs	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.54	F-0.52	F-0.52	F-0.52	F-0.51	F-0.51	F-0.434	F-0.51	F-0.434	F-0.434	F-0.424
Heated slabs	F-0.69	F-0.69	F-0.69	F-0.69	F-0.66	F-0.66	F-0.62	F-0.62	F-0.62	F-0.62	F-0.62	F-0.602	F-0.602	F-0.602	F-0.602	F-0.602
Opaque doors																
Nonswinging door	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31
Swinging door[g]	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37
Garage door < 14% glazing[h]	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31

For SI: 1 pound per square foot = 4.88 kg/m^2, 1 pound per cubic foot = 16 kg/m^3.

ci = Continuous Insulation, NR = No Requirement, LS = Liner System.

a. Where assembly *U*-factors, *C*-factors and *F*-factors are established in ANSI/ASHRAE/IESNA 90.1 Appendix A, such opaque assemblies shall be a compliance alternative where those values meet the criteria of this table, and provided that the construction, excluding the cladding system on walls, complies with the appropriate construction details from ANSI/ASHRAE/ISNEA 90.1 Appendix A.

b. Where *U*-factors have been established by testing in accordance with ASTM C1363, such opaque assemblies shall be a compliance alternative where those values meet the criteria of this table. The *R*-value of continuous insulation shall be permitted to be added to or subtracted from the original tested design.

c. Where heated slabs are below grade, below-grade walls shall comply with the *U*-factor requirements for above-grade mass walls.

d. "Mass floors" shall be in accordance with Section C402.2.3.

e. These *C*-, *F*- and *U*-factors are based on assemblies that are not required to contain insulation.

f. "Mass walls" shall be in accordance with Section C402.2.2.

g. Swinging door *U*-factors shall be determined in accordance with NFRC-100.

h. Garage doors having a single row of fenestration shall have an assembly *U*-factor less than or equal to 0.44 in Climate Zones 0 through 6 and less than or equal to 0.36 in Climate Zones 7 and 8, provided that the fenestration area is not less than 14 percent and not more than 25 percent of the total door area.

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C402.1.4.2 Thermal resistance of cold-formed steel walls. *U*-factors of walls with cold-formed steel studs shall be permitted to be determined in accordance with Equation 4-1.

$$U = 1/[R_s + (ER)] \quad \textbf{(Equation 4-1)}$$

where:

R_s = The cumulative *R*-value of the wall components along the path of heat transfer, excluding the *cavity insulation* and steel studs.

ER = The effective *R*-value of the *cavity insulation* with steel studs as specified in Table C402.1.4.2.

TABLE C402.1.4.2
EFFECTIVE *R*-VALUES FOR STEEL STUD WALL ASSEMBLIES

NOMINAL STUD DEPTH (inches)	SPACING OF FRAMING (inches)	CAVITY *R*-VALUE (insulation)	CORRECTION FACTOR (F_c)	EFFECTIVE *R*-VALUE (ER) (Cavity *R*-Value × F_c)
$3^1/_2$	16	13	0.46	5.98
		15	0.43	6.45
$3^1/_2$	24	13	0.55	7.15
		15	0.52	7.80
6	16	19	0.37	7.03
		21	0.35	7.35
6	24	19	0.45	8.55
		21	0.43	9.03
8	16	25	0.31	7.75
	24	25	0.38	9.50

For SI: 1 inch = 25.4 mm.

C402.1.5 Component performance alternative. Building envelope values and fenestration areas determined in accordance with Equation 4-2 shall be an alternative to compliance with the *U*-, *F*- and *C*-factors in Tables C402.1.4 and C402.4 and the maximum allowable fenestration areas in Section C402.4.1. *Fenestration* shall meet the applicable SHGC requirements of Section C402.4.3.

$$A + B + C + D + E \le \text{Zero} \quad \textbf{(Equation 4-2)}$$

where:

A = Sum of the (UA Dif) values for each distinct assembly type of the *building thermal envelope*, other than slabs on grade and below-grade walls.

UA Dif = UA Proposed – UA Table.

UA Proposed = Proposed *U*-value × Area.

UA Table = (*U*-factor from Table C402.1.3, C402.1.4 or C402.4) × Area.

B = Sum of the (FL Dif) values for each distinct slab-on-grade perimeter condition of the *building thermal envelope*.

FL Dif = FL Proposed – FL Table.

FL Proposed = Proposed *F*-value × Perimeter length.

FL Table = (*F*-factor specified in Table C402.1.4) × Perimeter length.

C = Sum of the (CA Dif) values for each distinct *below-grade wall* assembly type of the *building thermal envelope*.

CA Dif = CA Proposed – CA Table.

CA Proposed = Proposed *C*-value × Area.

CA Table = (Maximum allowable *C*-factor specified in Table C402.1.4) × Area.

Where the proposed vertical glazing area is less than or equal to the maximum vertical glazing area allowed by Section C402.4.1, the value of D (Excess Vertical Glazing Value) shall be zero. Otherwise:

D = (DA × UV) – (DA × U Wall), but not less than zero.

DA = (Proposed Vertical Glazing Area) – (Vertical Glazing Area allowed by Section C402.4.1).

UA Wall = Sum of the (UA Proposed) values for each opaque assembly of the exterior wall.

U Wall = Area-weighted average *U*-value of all above-grade wall assemblies.

UAV = Sum of the (UA Proposed) values for each vertical glazing assembly.

UV = UAV/total vertical glazing area.

Where the proposed skylight area is less than or equal to the skylight area allowed by Section C402.4.1, the value of E (Excess Skylight Value) shall be zero. Otherwise:

E = (EA × US) – (EA × U Roof), but not less than zero.

EA = (Proposed Skylight Area) – (Allowable Skylight Area as specified in Section C402.4.1).

U Roof = Area-weighted average *U*-value of all roof assemblies.

UAS = Sum of the (UA Proposed) values for each skylight assembly.

US = UAS/total skylight area.

C402.2 Specific building thermal envelope insulation requirements. Insulation in *building thermal envelope* opaque assemblies shall comply with Sections C402.2.1 through C402.2.7 and Table C402.1.3.

C402.2.1 Roof assembly. The minimum thermal resistance (*R*-value) of the insulating material installed either between the roof framing or continuously on the roof assembly shall be as specified in Table C402.1.3, based on construction materials used in the roof assembly.

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C402.2.1.1 Tapered, above-deck insulation based on thickness. Where used as a component of a roof/ceiling assembly *R*-value calculation, the sloped roof insulation *R*-value contribution to that calculation shall use the average thickness in inches (mm) along with the material *R*-value-per-inch (per-mm) solely for *R*-value compliance as prescribed in Section 402.1.3.

C402.2.1.2 Minimum thickness, lowest point. The minimum thickness of above-deck roof insulation at its lowest point, gutter edge, roof drain or scupper, shall be not less than 1 inch (25 mm).

C402.2.1.3 Suspended ceilings. Insulation installed on suspended ceilings having removable ceiling tiles shall not be considered part of the minimum thermal resistance (*R*-value) of roof insulation in roof/ceiling construction.

C402.2.1.4 Joints staggered. Continuous insulation board shall be installed in not less than two layers and the edge joints between each layer of insulation shall be staggered, except where insulation tapers to the roof deck at a gutter edge, roof drain or scupper.

C402.2.1.5 Skylight curbs. Skylight curbs shall be insulated to the level of roofs with insulation entirely above the deck or R-5, whichever is less.

Exception: Unit skylight curbs included as a component of a skylight listed and labeled in accordance with NFRC 100 shall not be required to be insulated.

C402.2.2 Above-grade walls. The minimum thermal resistance (*R*-value) of materials installed in the wall cavity between framing members and continuously on the walls shall be as specified in Table C402.1.3, based on framing type and construction materials used in the wall assembly. The *R*-value of integral insulation installed in concrete masonry units shall not be used in determining compliance with Table C402.1.3 except as otherwise noted in the table. In determining compliance with Table C402.1.4, the use of the *U*-factor of concrete masonry units with integral insulation shall be permitted.

"Mass walls" where used as a component in the thermal envelope of a building shall comply with one of the following:

1. Weigh not less than 35 pounds per square foot (171 kg/m^2) of wall surface area.
2. Weigh not less than 25 pounds per square foot (122 kg/m^2) of wall surface area where the material weight is not more than 120 pcf (1900 kg/m^3).
3. Have a heat capacity exceeding 7 Btu/ft^2 × °F (144 kJ/m^2 × K).
4. Have a heat capacity exceeding 5 Btu/ft^2 × °F (103 kJ/m^2 × K), where the material weight is not more than 120 pcf (1900 kg/m^3).

C402.2.3 Floors. The thermal properties (component *R*-values or assembly *U*-, *C*- or *F*-factors) of floor assemblies over outdoor air or unconditioned space shall be as specified in Table C402.1.3 or C402.1.4 based on the construction materials used in the floor assembly. Floor framing *cavity insulation* or structural slab insulation shall be installed to maintain permanent contact with the underside of the subfloor decking or structural slabs.

"Mass floors" where used as a component of the thermal envelope of a building shall provide one of the following weights:

1. 35 pounds per square foot (171 kg/m^2) of floor surface area.
2. 25 pounds per square foot (122 kg/m^2) of floor surface area where the material weight is not more than 120 pounds per cubic foot (1923 kg/m^3).

Exceptions:

1. The floor framing *cavity insulation* or structural slab insulation shall be permitted to be in contact with the top side of sheathing or continuous insulation installed on the bottom side of floor assemblies where combined with insulation that meets or exceeds the minimum *R*-value in Table C402.1.3 for "Metal framed" or "Wood framed and other" values for "Walls, above grade" and extends from the bottom to the top of all perimeter floor framing or floor assembly members.
2. Insulation applied to the underside of concrete floor slabs shall be permitted an airspace of not more than 1 inch (25 mm) where it turns up and is in contact with the underside of the floor under walls associated with the *building thermal envelope*.

C402.2.4 Slabs-on-grade. The minimum thermal resistance (*R*-value) of the insulation for unheated or heated slab-on-grade floors designed in accordance with the *R*-value method of Section C402.1.3 shall be as specified in Table C402.1.3.

C402.2.4.1 Insulation installation. Where installed, the perimeter insulation shall be placed on the outside of the foundation or on the inside of the foundation wall. The perimeter insulation shall extend downward from the top of the slab for the minimum distance shown in the table or to the top of the footing, whichever is less, or downward to not less than the bottom of the slab and then horizontally to the interior or exterior for the total distance shown in the table. Insulation extending away from the building shall be protected by pavement or by not less than 10 inches (254 mm) of soil. Where installed, full slab insulation shall be continuous under the entire area of the slab-on-grade floor, except at structural column locations and service penetrations. Insulation required at the heated slab

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perimeter shall not be required to extend below the bottom of the heated slab and shall be continuous with the full slab insulation.

Exception: Where the slab-on-grade floor is greater than 24 inches (61 mm) below the finished exterior grade, perimeter insulation is not required.

C402.2.5 Below-grade walls. The *C*-factor for the below-grade exterior walls shall be in accordance with Table C402.1.4. The *R*-value of the insulating material installed continuously within or on the below-grade exterior walls of the building envelope shall be in accordance with Table C402.1.3. The *C*-factor or *R*-value required shall extend to a depth of not less than 10 feet (3048 mm) below the outside finished ground level, or to the level of the lowest floor of the conditioned space enclosed by the below-grade wall, whichever is less.

C402.2.6 Insulation of radiant heating systems. *Radiant heating system* panels, and their associated components that are installed in interior or exterior assemblies, shall be insulated to an *R*-value of not less than R-3.5 on all surfaces not facing the space being heated. *Radiant heating system* panels that are installed in the *building thermal envelope* shall be separated from the exterior of the building or unconditioned or exempt spaces by not less than the *R*-value of insulation installed in the opaque assembly in which they are installed or the assembly shall comply with Section C402.1.4.

Exception: Heated slabs on grade insulated in accordance with Section C402.2.4.

C402.2.7 Airspaces. Where the *R*-value of an airspace is used for compliance in accordance with Section C402.1, the airspace shall be enclosed in an unventilated cavity constructed to minimize airflow into and out of the enclosed airspace. Airflow shall be deemed minimized where the enclosed airspace is located on the interior side of the continuous air barrier and is bounded on all sides by building components.

Exception: The thermal resistance of airspaces located on the exterior side of the continuous air barrier and adjacent to and behind the exterior wall-covering material shall be determined in accordance with ASTM C1363 modified with an airflow entering the bottom and exiting the top of the airspace at an air movement rate of not less than 70 mm/second.

C402.3 Roof solar reflectance and thermal emittance. Low-sloped roofs directly above cooled conditioned spaces in *Climate Zones* 0 through 3 shall comply with one or more of the options in Table C402.3.

Exceptions: The following roofs and portions of roofs are exempt from the requirements of Table C402.3:

1. Portions of the roof that include or are covered by the following:
   1.1. Photovoltaic systems or components.
   1.2. Solar air or water-heating systems or components.
   1.3. Vegetative roofs or landscaped roofs.
   1.4. Above-roof decks or walkways.
   1.5. Skylights.
   1.6. HVAC systems and components, and other opaque objects mounted above the roof.
2. Portions of the roof shaded during the peak sun angle on the summer solstice by permanent features of the building or by permanent features of adjacent buildings.
3. Portions of roofs that are ballasted with a minimum stone ballast of 17 pounds per square foot (74 kg/m^2) or 23 psf (117 kg/m^2) pavers.
4. Roofs where not less than 75 percent of the roof area complies with one or more of the exceptions to this section.

TABLE C402.3
MINIMUM ROOF REFLECTANCE AND EMITTANCE OPTIONS[a]

Three-year-aged solar reflectance[b] of 0.55 and 3-year aged thermal emittance[c] of 0.75
Three-year-aged solar reflectance index[d] of 64

a. The use of area-weighted averages to comply with these requirements shall be permitted. Materials lacking 3-year-aged tested values for either solar reflectance or thermal emittance shall be assigned both a 3-year-aged solar reflectance in accordance with Section C402.3.1 and a 3-year-aged thermal emittance of 0.90.
b. Aged solar reflectance tested in accordance with ASTM C1549, ASTM E903 or ASTM E1918 or CRRC-S100.
c. Aged thermal emittance tested in accordance with ASTM C1371 or ASTM E408 or CRRC-S100.
d. Solar reflectance index (SRI) shall be determined in accordance with ASTM E1980 using a convection coefficient of 2.1 Btu/h × ft^2 × °F (12 W/m^2 × K). Calculation of aged SRI shall be based on aged tested values of solar reflectance and thermal emittance.

C402.3.1 Aged roof solar reflectance. Where an aged solar reflectance required by Section C402.3 is not available, it shall be determined in accordance with Equation 4-3.

$$R_{aged} = [0.2 + 0.7(R_{initial} - 0.2)] \quad \textbf{(Equation 4-3)}$$

where:

R_{aged} = The aged solar reflectance.

$R_{initial}$ = The initial solar reflectance determined in accordance with CRRC-S100.

C402.4 Fenestration. Fenestration shall comply with Sections C402.4.1 through C402.4.5 and Table C402.4. Daylight responsive controls shall comply with this section and Section C405.2.4.

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TABLE C402.4
BUILDING ENVELOPE FENESTRATION MAXIMUM *U*-FACTOR AND SHGC REQUIREMENTS

CLIMATE ZONE	0 AND 1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
Vertical fenestration																
***U*-factor**																
Fixed fenestration	0.50		0.45		0.42		0.36		0.36		0.34		0.29		0.26	
Operable fenestration	0.62		0.60		0.54		0.45		0.45		0.42		0.36		0.32	
Entrance doors	0.83		0.77		0.68		0.63		0.63		0.63		0.63		0.63	
SHGC																
	Fixed	Operable	Fixed	Operable	Fixed	Operable	Fixed	Operable	Fixed	Operable	Fixed	Operable	Fixed	Operable	Fixed	Operable
PF < 0.2	0.23	0.21	0.25	0.23	0.25	0.23	0.36	0.33	0.38	0.33	0.38	0.34	0.40	0.36	0.40	0.36
0.2 ≤ PF < 0.5	0.28	0.25	0.30	0.28	0.30	0.28	0.43	0.40	0.46	0.40	0.46	0.41	0.48	0.43	0.48	0.43
PF ≥ 0.5	0.37	0.34	0.40	0.37	0.40	0.37	0.58	0.53	0.61	0.53	0.61	0.54	0.64	0.58	0.64	0.58
Skylights																
U-factor	0.70		0.65		0.55		0.50		0.50		0.50		0.44		0.41	
SHGC	0.30		0.30		0.30		0.40		0.40		0.40		NR		NR	

NR = No Requirement, PF = Projection Factor.

C402.4.1 Maximum area. The vertical fenestration area, not including opaque doors and opaque spandrel panels, shall be not greater than 30 percent of the gross above-grade wall area. The skylight area shall be not greater than 3 percent of the gross roof area.

C402.4.1.1 Increased vertical fenestration area with daylight responsive controls. In *Climate Zones* 0 through 6, not more than 40 percent of the gross above-grade wall area shall be vertical fenestration, provided that all of the following requirements are met:

1. In buildings not greater than two stories above grade, not less than 50 percent of the net floor area is within a *daylight zone*.
2. In buildings three or more stories above grade, not less than 25 percent of the net floor area is within a *daylight zone*.
3. *Daylight responsive controls* are installed in *daylight zones*.
4. Visible transmittance (VT) of vertical fenestration is not less than 1.1 times solar heat gain coefficient (SHGC).

   Exception: Fenestration that is outside the scope of NFRC 200 is not required to comply with Item 4.

C402.4.1.2 Increased skylight area with daylight responsive controls. The skylight area shall be not more than 6 percent of the roof area provided that *daylight responsive controls* are installed in *toplit daylight zones*.

C402.4.2 Minimum skylight fenestration area. Skylights shall be provided in enclosed spaces greater than 2,500 square feet (232 m^2) in floor area, directly under a roof with not less than 75 percent of the ceiling area with a ceiling height greater than 15 feet (4572 mm), and used as an office, lobby, atrium, concourse, corridor, storage space, gymnasium/exercise center, convention center, automotive service area, space where manufacturing occurs, nonrefrigerated warehouse, retail store, distribution/sorting area, transportation depot or workshop. The total *toplit daylight zone* shall be not less than half the floor area and shall comply with one of the following:

1. A minimum skylight area to *toplit daylight zone* of not less than 3 percent where all skylights have a VT of not less than 0.40, or VT_{annual} of not less than 0.26, as determined in accordance with Section C303.1.3.
2. A minimum skylight effective aperture, determined in accordance with Equation 4-4, of:
   2.1. Not less than 1 percent using a skylight's VT rating; or
   2.2. Not less than 0.66 percent using a Tubular Daylight Device's VT_{annual} rating.

$$\text{Skylight Effective Aperture} = \frac{0.85 \times \text{Skylight Area} \times \text{Skylight VT} \times \text{WF}}{\text{Toplit Zone}}$$

(Equation 4-4)

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where:

Skylight area = Total fenestration area of skylights.

Skylight VT = Area weighted average visible transmittance of skylights.

WF = Area weighted average well factor, where well factor is 0.9 if light well depth is less than 2 feet (610 mm), or 0.7 if light well depth is 2 feet (610 mm) or greater, or 1.0 for Tubular Daylighting Devices with VT_{annual} ratings.

Light well depth = Measure vertically from the underside of the lowest point of the skylight glazing to the ceiling plane under the skylight.

Exception: Skylights above *daylight zones* of enclosed spaces are not required in:

1. Buildings in *Climate Zones* 6 through 8.
2. Spaces where the designed *general lighting* power densities are less than 0.5 W/ft^2 (5.4 W/m^2).
3. Areas where it is documented that existing structures or natural objects block direct beam sunlight on not less than half of the roof over the enclosed area for more than 1,500 daytime hours per year between 8 a.m. and 4 p.m.
4. Spaces where the *daylight zone* under rooftop monitors is greater than 50 percent of the enclosed space floor area.
5. Spaces where the total area minus the area of *sidelit daylight zones* is less than 2,500 square feet (232 m^2), and where the lighting is controlled in accordance with Section C405.2.3.
6. Spaces designed as storm shelters complying with ICC 500.

C402.4.2.1 Lighting controls in toplit daylight zones. *Daylight responsive controls* shall be provided in toplit daylight zones.

C402.4.2.2 Haze factor. Skylights in office, storage, automotive service, manufacturing, nonrefrigerated warehouse, retail store and distribution/sorting area spaces shall have a glazing material or diffuser with a haze factor greater than 90 percent when tested in accordance with ASTM D1003.

Exception: Skylights and tubular daylighting devices designed and installed to exclude direct sunlight entering the occupied space by the use of fixed or automated baffles, the geometry of skylight and light well or the use of optical diffuser components.

C402.4.3 Maximum *U*-factor and SHGC. The maximum *U*-factor and solar heat gain coefficient (SHGC) for fenestration shall be as specified in Table C402.4.

The window projection factor shall be determined in accordance with Equation 4-5.

$$PF = A/B \qquad \textbf{(Equation 4-5)}$$

where:

PF = Projection factor (decimal).

A = Distance measured horizontally from the farthest continuous extremity of any overhang, eave or permanently attached shading device to the vertical surface of the glazing.

B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave or permanently attached shading device.

Where different windows or glass doors have different *PF* values, they shall each be evaluated separately.

C402.4.3.1 Increased skylight SHGC. In *Climate Zones* 0 through 6, skylights shall be permitted a maximum SHGC of 0.60 where located above *daylight zones* provided with *daylight responsive controls*.

C402.4.3.2 Increased skylight *U*-factor. Where skylights are installed above *daylight zones* provided with *daylight responsive controls*, a maximum *U*-factor of 0.9 shall be permitted in *Climate Zones* 0 through 3 and a maximum *U*-factor of 0.75 shall be permitted in *Climate Zones* 4 through 8.

C402.4.3.3 Dynamic glazing. Where dynamic glazing is intended to satisfy the SHGC and VT requirements of Table C402.4, the ratio of the higher to lower labeled SHGC shall be greater than or equal to 2.4, and the *dynamic glazing* shall be automatically controlled to modulate the amount of solar gain into the space in multiple steps. Dynamic glazing shall be considered separately from other fenestration, and area-weighted averaging with other fenestration that is not dynamic glazing shall not be permitted.

Exception: Dynamic glazing is not required to comply with this section where both the lower and higher labeled SHGC already comply with the requirements of Table C402.4.

C402.4.3.4 Area-weighted *U*-factor. An area-weighted average shall be permitted to satisfy the *U*-factor requirements for each fenestration product category listed in Table C402.4. Individual fenestration products from different fenestration product categories listed in Table C402.4 shall not be combined in calculating area-weighted average *U*-factor.

C402.4.4 Daylight zones. Daylight zones referenced in Sections C402.4.1.1 through C402.4.3.2 shall comply with Sections C405.2.4.2 and C405.2.4.3, as applicable.

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Daylight zones shall include *toplit daylight zones* and sidelit *daylight* zones.

C402.4.5 Doors. Opaque swinging doors shall comply with Table C402.1.4. Opaque nonswinging doors shall comply with Table C402.1.4. Opaque doors shall be considered as part of the gross area of above-grade walls that are part of the *building thermal envelope*. Opaque doors shall comply with Section C402.4.5.1 or C402.4.5.2. Other doors shall comply with the provisions of Section C402.4.3 for vertical fenestration.

C402.4.5.1 Opaque swinging doors. Opaque swinging doors shall comply with Table C402.1.4.

C402.4.5.2 Nonswinging doors. Opaque nonswinging doors that are horizontally hinged sectional doors with a single row of fenestration shall have an assembly *U*-factor less than or equal to 0.440 in Climate Zones 0 through 6 and less than or equal to 0.360 in Climate Zones 7 and 8, provided that the fenestration area is not less than 14 percent and not more than 25 percent of the total door area.

Exception: Other doors shall comply with the provisions of Section C402.4.3 for vertical fenestration.

C402.5 Air leakage—thermal envelope. The *building thermal envelope* shall comply with Sections C402.5.1 through Section C402.5.11.1, or the building *thermal envelope* shall be tested in accordance with Section C402.5.2 or C402.5.3. Where compliance is based on such testing, the building shall also comply with Sections C402.5.7, C402.5.8 and C402.5.9.

C402.5.1 Air barriers. A continuous air barrier shall be provided throughout the *building thermal envelope*. The continuous air barriers shall be located on the inside or outside of the building thermal envelope, located within the assemblies composing the building thermal envelope, or any combination thereof. The air barrier shall comply with Sections C402.5.1.1, and C402.5.1.2.

Exception: Air barriers are not required in buildings located in *Climate Zone* 2B.

C402.5.1.1 Air barrier construction. The *continuous air barrier* shall be constructed to comply with the following:

1. The air barrier shall be continuous for all assemblies that are the thermal envelope of the building and across the joints and assemblies.
2. Air barrier joints and seams shall be sealed, including sealing transitions in places and changes in materials. The joints and seals shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation.
3. Penetrations of the air barrier shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location. Sealing shall allow for expansion, contraction and mechanical vibration. Joints and seams associated with penetrations shall be sealed in the same manner or taped. Sealing materials shall be securely installed around the penetration so as not to dislodge, loosen or otherwise impair the penetrations' ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation. Sealing of concealed fire sprinklers, where required, shall be in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.
4. Recessed lighting fixtures shall comply with Section C402.5.10. Where similar objects are installed that penetrate the air barrier, provisions shall be made to maintain the integrity of the air barrier.

C402.5.1.2 Air barrier compliance. A continuous air barrier for the opaque building envelope shall comply with the following:

1. Buildings or portions of buildings, including Group R and I occupancies, shall meet the provisions of Section C402.5.2.

   Exception: Buildings in Climate Zones 2B, 3C and 5C.
2. Buildings or portions of buildings other than Group R and I occupancies shall meet the provisions of Section C402.5.3.

   Exceptions:

   1. Buildings in Climate Zones 2B, 3B, 3C and 5C.
   2. Buildings larger than 5,000 square feet (464.5 m^2) floor area in Climate Zones 0B, 1, 2A, 4B and 4C.
   3. Buildings between 5,000 square feet (464.5 m^2) and 50,000 square feet (4645 m^2) floor area in Climate Zones 0A, 3A and 5B.
3. Buildings or portions of buildings that do not complete air barrier testing shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5.

C402.5.1.3 Materials. Materials with an air permeability not greater than 0.004 cfm/ft^2 (0.02 L/s × m^2) under a pressure differential of 0.3 inch water gauge (75 Pa) when tested in accordance with ASTM E2178 shall comply with this section. Materials in Items 1 through 16 shall be deemed to comply with this section, provided that joints are sealed and materials

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are installed as air barriers in accordance with the manufacturer's instructions.

1. Plywood with a thickness of not less than $^3/_8$ inch (10 mm).
2. Oriented strand board having a thickness of not less than $^3/_8$ inch (10 mm).
3. Extruded polystyrene insulation board having a thickness of not less than $^1/_2$ inch (12.7 mm).
4. Foil-back polyisocyanurate insulation board having a thickness of not less than $^1/_2$ inch (12.7 mm).
5. Closed-cell spray foam having a minimum density of 1.5 pcf (2.4 kg/m^3) and having a thickness of not less than $1^1/_2$ inches (38 mm).
6. Open-cell spray foam with a density between 0.4 and 1.5 pcf (0.6 and 2.4 kg/m^3) and having a thickness of not less than 4.5 inches (113 mm).
7. Exterior or interior gypsum board having a thickness of not less than $^1/_2$ inch (12.7 mm).
8. Cement board having a thickness of not less than $^1/_2$ inch (12.7 mm).
9. Built-up roofing membrane.
10. Modified bituminous roof membrane.
11. Single-ply roof membrane.
12. A Portland cement/sand parge, or gypsum plaster having a thickness of not less than $^5/_8$ inch (15.9 mm).
13. Cast-in-place and precast concrete.
14. Fully grouted concrete block masonry.
15. Sheet steel or aluminum.
16. Solid or hollow masonry constructed of clay or shale masonry units.

C402.5.1.4 Assemblies. Assemblies of materials and components with an average air leakage not greater than 0.04 cfm/ft^2 (0.2 L/s × m^2) under a pressure differential of 0.3 inch of water gauge (w.g.)(75 Pa) when tested in accordance with ASTM E2357, ASTM E1677, ASTM D8052 or ASTM E283 shall comply with this section. Assemblies listed in Items 1 through 3 shall be deemed to comply, provided that joints are sealed and the requirements of Section C402.5.1.1 are met.

1. Concrete masonry walls coated with either one application of block filler or two applications of a paint or sealer coating.
2. Masonry walls constructed of clay or shale masonry units with a nominal width of 4 inches (102 mm) or more.
3. A Portland cement/sand parge, stucco or plaster not less than $^1/_2$ inch (12.7 mm) in thickness.

C402.5.1.5 Building envelope performance verification. The installation of the continuous air barrier shall be verified by the *code official*, a *registered design professional* or *approved* agency in accordance with the following:

1. A review of the construction documents and other supporting data shall be conducted to assess compliance with the requirements in Section C402.5.1.
2. Inspection of continuous air barrier components and assemblies shall be conducted during construction while the air barrier is still accessible for inspection and repair to verify compliance with the requirements of Sections C402.5.1.3 and C402.5.1.4.
3. A final commissioning report shall be provided for inspections completed by the *registered design professional* or *approved* agency. The commissioning report shall be provided to the building owner or owner's authorized agent and the *code official*. The report shall identify deficiencies found during the review of the construction documents and inspection and details of corrective measures taken.

C402.5.2 Dwelling and sleeping unit enclosure testing. The *building thermal envelope* shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E1827 or an equivalent method approved by the *code official*. The measured air leakage shall not exceed 0.30 cfm/ft^2 (1.5 L/s m^2) of the testing unit enclosure area at a pressure differential of 0.2 inch water gauge (50 Pa). Where multiple dwelling units or sleeping units or other occupiable conditioned spaces are contained within one *building thermal envelope*, each unit shall be considered an individual testing unit, and the building air leakage shall be the weighted average of all testing unit results, weighted by each testing unit's enclosure area. Units shall be tested separately with an unguarded blower door test as follows:

1. Where buildings have fewer than eight testing units, each testing unit shall be tested.
2. For buildings with eight or more testing units, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit and a unit with the largest testing unit enclosure area. For each tested unit that exceeds the maximum air leakage rate, an additional two units shall be tested, including a mixture of testing unit types and locations.

C402.5.3 Building thermal envelope testing. The *building thermal envelope* shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E3158 or ASTM E1827 or an equivalent method approved by the

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code official. The measured air leakage shall not exceed 0.40 cfm/ft^2 (2.0 L/s × m^2) of the *building thermal envelope* area at a pressure differential of 0.3 inch water gauge (75 Pa). Alternatively, portions of the building shall be tested and the measured air leakages shall be area weighted by the surface areas of the building envelope in each portion. The weighted average test results shall not exceed the whole building leakage limit. In the alternative approach, the following portions of the building shall be tested:

1. The entire envelope area of all stories that have any spaces directly under a roof.
2. The entire envelope area of all stories that have a building entrance, exposed floor, or loading dock, or are below grade.
3. Representative above-grade sections of the building totaling at least 25 percent of the wall area enclosing the remaining conditioned space.

Exception: Where the measured air leakage rate exceeds 0.40 cfm/ft^2 (2.0 L/s × m^2) but does not exceed 0.60 cfm/ft^2 (3.0 L/s × m^2), a diagnostic evaluation using smoke tracer or infrared imaging shall be conducted while the building is pressurized along with a visual inspection of the air barrier. Any leaks noted shall be sealed where such sealing can be made without destruction of existing building components. An additional report identifying the corrective actions taken to seal leaks shall be submitted to the code official and the building owner, and shall be deemed to comply with the requirements of this section.

C402.5.4 Air leakage of fenestration. The air leakage of fenestration assemblies shall meet the provisions of Table C402.5.4. Testing shall be in accordance with the applicable reference test standard in Table C402.5.4 by an accredited, independent testing laboratory and *labeled* by the manufacturer.

Exceptions:

1. Field-fabricated fenestration assemblies that are sealed in accordance with Section C402.5.1.
2. Fenestration in buildings that comply with the testing alternative of Section C402.5 are not required to meet the air leakage requirements in Table C402.5.4.

C402.5.5 Rooms containing fuel-burning appliances. In *Climate Zones* 3 through 8, where combustion air is supplied through openings in an exterior wall to a room or space containing a space-conditioning fuel-burning appliance, one of the following shall apply:

1. The room or space containing the appliance shall be located outside of the *building thermal envelope*.
2. The room or space containing the appliance shall be enclosed and isolated from conditioned spaces inside the *building thermal envelope*. Such rooms shall comply with all of the following:
   2.1. The walls, floors and ceilings that separate the enclosed room or space from conditioned spaces shall be insulated to be not less than equivalent to the insulation requirement of below-grade walls as specified in Table C402.1.3 or Table C402.1.4.
   2.2. The walls, floors and ceilings that separate the enclosed room or space from conditioned spaces shall be sealed in accordance with Section C402.5.1.1.

TABLE C402.5.4
MAXIMUM AIR LEAKAGE RATE FOR FENESTRATION ASSEMBLIES

FENESTRATION ASSEMBLY	MAXIMUM RATE (CFM/FT^2)	TEST PROCEDURE
Windows	0.20[a]	AAMA/WDMA/CSA101/I.S.2/A440 or NFRC 400
Sliding doors	0.20[a]	
Swinging doors	0.20[a]	
Skylights—with condensation weepage openings	0.30	
Skylights—all other	0.20[a]	
Curtain walls	0.06	NFRC 400 or ASTM E283 at 1.57 psf (75 Pa)
Storefront glazing	0.06	
Commercial glazed swinging entrance doors	1.00	
Power-operated sliding doors and power operated folding doors	1.00	
Revolving doors	1.00	
Garage doors	0.40	ANSI/DASMA 105, NFRC 400, or ASTM E283 at 1.57 psf (75 Pa)
Rolling doors	1.00	
High-speed doors	1.30	

For SI: 1 cubic foot per minute = 0.47 L/s, 1 square foot = 0.093 m^2.

a. The maximum rate for windows, sliding and swinging doors, and skylights is permitted to be 0.3 cfm per square foot of fenestration or door area when tested in accordance with AAMA/WDMA/CSA101/I.S.2/A440 at 6.24 psf (300 Pa).

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2.3. The doors into the enclosed room or space shall be fully gasketed.

2.4. Water lines and ducts in the enclosed room or space shall be insulated in accordance with Section C403.

2.5. Where an air duct supplying combustion air to the enclosed room or space passes through *conditioned space*, the duct shall be insulated to an *R*-value of not less than R-8.

Exception: Fireplaces and stoves complying with Sections 901 through 905 of the *International Mechanical Code*, and Section 2111.14 of the *International Building Code*.

C402.5.6 Doors and access openings to shafts, chutes, stairways and elevator lobbies. Doors and *access* openings from conditioned space to shafts, chutes stairways and elevator lobbies not within the scope of the fenestration assemblies covered by Section C402.5.4 shall be gasketed, weather-stripped or sealed.

Exceptions:

1. Door openings required to comply with Section 716 of the *International Building Code*.
2. Doors and door openings required to comply with UL 1784 by the *International Building Code*.

C402.5.7 Air intakes, exhaust openings, stairways and shafts. Stairway enclosures, elevator shaft vents and other outdoor air intakes and exhaust openings integral to the building envelope shall be provided with dampers in accordance with Section C403.7.7.

C402.5.8 Loading dock weather seals. Cargo door openings and loading door openings shall be equipped with weather seals that restrict infiltration and provide direct contact along the top and sides of vehicles that are parked in the doorway.

C402.5.9 Vestibules. Building entrances shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time. The installation of one or more revolving doors in the *building entrance* shall not eliminate the requirement that a vestibule be provided on any doors adjacent to revolving doors.

Exceptions: Vestibules are not required for the following:

1. Buildings in *Climate Zones* 0 through 2.
2. Doors not intended to be used by the public, such as doors to mechanical or electrical equipment rooms, or intended solely for employee use.
3. Doors opening directly from a *sleeping unit* or dwelling unit.
4. Doors that open directly from a space less than 3,000 square feet (298 m^2) in area.
5. Revolving doors.
6. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.
7. Doors that have an air curtain with a velocity of not less than 6.56 feet per second (2 m/s) at the floor that have been tested in accordance with ANSI/AMCA 220 and installed in accordance with the manufacturer's instructions. Manual or automatic controls shall be provided that will operate the air curtain with the opening and closing of the door. Air curtains and their controls shall comply with Section C408.2.3.

C402.5.10 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be all of the following:

1. IC-rated.
2. Labeled as having an air leakage rate of not more 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E283 at a 1.57 psf (75 Pa) pressure differential.
3. Sealed with a gasket or caulk between the housing and interior wall or ceiling covering.

C402.5.11 Operable openings interlocking. Where occupancies utilize operable openings to the outdoors that are larger than 40 square feet (3.7 m^2) in area, such openings shall be interlocked with the heating and cooling system so as to raise the cooling setpoint to 90°F (32°C) and lower the heating setpoint to 55°F (13°C) whenever the operable opening is open. The change in heating and cooling setpoints shall occur within 10 minutes of opening the operable opening.

Exceptions:

1. Separately zoned areas associated with the preparation of food that contain appliances that contribute to the HVAC loads of a restaurant or similar type of occupancy.
2. Warehouses that utilize overhead doors for the function of the occupancy, where approved by the code official.
3. The first entrance doors where located in the exterior wall and are part of a vestibule system.

C402.5.11.1 Operable controls. Controls shall comply with Section C403.14.

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SECTION C403
BUILDING MECHANICAL SYSTEMS

C403.1 General. Mechanical systems and equipment serving the building heating, cooling, ventilating or refrigerating needs shall comply with this section.

Exception: Data center systems are exempt from the requirements of Sections C403.4 and C403.5.

C403.1.1 Calculation of heating and cooling loads. Design loads associated with heating, ventilating and air conditioning of the building shall be determined in accordance with ANSI/ASHRAE/ACCA Standard 183 or by an *approved* equivalent computational procedure using the design parameters specified in Chapter 3. Heating and cooling loads shall be adjusted to account for load reductions that are achieved where energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE HVAC Systems and Equipment Handbook by an approved equivalent computational procedure.

C403.1.2 Data centers. Data center systems shall comply with Sections 6 and 8 of ASHRAE 90.4 with the following changes:

1. Replace design mechanical load component (MLC) values specified in Table 6.2.1.1 of the ASHRAE 90.4 with the values in Table C403.1.2(1) as applicable in each climate zone.
2. Replace annualized MLC values specified in Table 6.2.1.2 of the ASHRAE 90.4 with the values in Table C403.1.2(2) as applicable in each climate zone.

TABLE C403.1.2(1)
MAXIMUM DESIGN MECHANICAL LOAD COMPONENT (DESIGN MLC)

CLIMATE ZONE	DESIGN MLC AT 100% AND AT 50% ITE LOAD
0A	0.24
OB	0.26
1A	0.23
2A	0.24
3A	0.23
4A	0.23
5A	0.22
6A	0.22
1B	0.28
2B	0.27
3B	0.26
4B	0.23
5B	0.23
6B	0.21
3C	0.19
4C	0.21
5C	0.19
7	0.20
8	0.19

TABLE C403.1.2(2)
MAXIMUM ANNUALIZED MECHANICAL LOAD COMPONENT (ANNUALIZED MLC)

CLIMATE ZONE	HVAC MAXIMUM ANNUALIZED MLC AT 100% AND AT 50% ITE LOAD
0A	0.19
0B	0.20
1A	0.18
2A	0.19
3A	0.18
4A	0.17
5A	0.17
6A	0.17
1B	0.16
2B	0.18
3B	0.18
4B	0.18
5B	0.16
6B	0.17
3C	0.16
4C	0.16
5C	0.16
7	0.16
8	0.16

C403.2 System design. Mechanical systems shall be designed to comply with Sections C403.2.1 through C403.2.3. Where elements of a building's mechanical systems are addressed in Sections C403.3 through C403.14, such elements shall comply with the applicable provisions of those sections.

C403.2.1 Zone isolation required. HVAC systems serving *zones* that are over 25,000 square feet (2323 m^2) in floor area or that span more than one floor and are designed to operate or be occupied nonsimultaneously shall be divided into isolation areas. Each isolation area shall be equipped with *isolation devices* and controls configured to automatically shut off the supply of conditioned air and outdoor air to and exhaust air from the isolation area. Each isolation area shall be controlled independently by a device meeting the requirements of Section C403.4.2.2. Central systems and plants shall be provided with controls and devices that will allow system and equipment operation for any length of time while serving only the smallest isolation area served by the system or plant.

Exceptions:

1. Exhaust air and outdoor air connections to isolation areas where the fan system to which they connect is not greater than 5,000 cfm (2360 L/s).

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2. Exhaust airflow from a single isolation area of less than 10 percent of the design airflow of the exhaust system to which it connects.
3. Isolation areas intended to operate continuously or intended to be inoperative only when all other isolation areas in a *zone* are inoperative.

C403.2.2 Ventilation. Ventilation, either natural or mechanical, shall be provided in accordance with Chapter 4 of the *International Mechanical Code*. Where mechanical ventilation is provided, the system shall provide the capability to reduce the outdoor air supply to the minimum required by Chapter 4 of the *International Mechanical Code*.

C403.2.3 Fault detection and diagnostics. New buildings with an HVAC system serving a gross conditioned floor area of 100,000 square feet (9290 m^2) or larger shall include a fault detection and diagnostics (FDD) system to monitor the HVAC system's performance and automatically identify faults. The FDD system shall:

1. Include permanently installed sensors and devices to monitor the HVAC system's performance.
2. Sample the HVAC system's performance at least once every 15 minutes.
3. Automatically identify and report HVAC system faults.
4. Automatically notify authorized personnel of identified HVAC system faults.
5. Automatically provide prioritized recommendations for repair of identified faults based on analysis of data collected from the sampling of HVAC system performance.
6. Be capable of transmitting the prioritized fault repair recommendations to remotely located authorized personnel.

Exception: R-1 and R-2 occupancies.

C403.3 Heating and cooling equipment efficiencies. Heating and cooling equipment installed in mechanical systems shall be sized in accordance with Section C403.3.1 and shall be not less efficient in the use of energy than as specified in Section C403.3.2.

C403.3.1 Equipment sizing. The output capacity of heating and cooling equipment shall be not greater than that of the smallest available equipment size that exceeds the loads calculated in accordance with Section C403.1.1. A single piece of equipment providing both heating and cooling shall satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.

Exceptions:

1. Required standby equipment and systems provided with controls and devices that allow such systems or equipment to operate automatically only when the primary equipment is not operating.
2. Multiple units of the same equipment type with combined capacities exceeding the design load and provided with controls that are configured to sequence the operation of each unit based on load.

C403.3.2 HVAC equipment performance requirements. Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein.

C403.3.2.1 Water-cooled centrifugal chilling packages. Equipment not designed for operation at AHRI Standard 550/590 test conditions of 44.00°F leaving and 54.00°F entering chilled-fluid temperatures, and with 85.00°F entering and 94.30°F leaving condenser-fluid temperatures, shall have maximum full-load kW/ton (FL) and part-load rating requirements adjusted using the following equations:

$$FL_{adj} = FL/K_{adj} \quad \textbf{(Equation 4-6)}$$

$$PLV_{adj} = IPLV.IP/K_{adj} \quad \textbf{(Equation 4-7)}$$

where:

K_{adj} = $A \times B$

FL = Full-load kW/ton value from Table C403.3.2(3).

FL_{adj} = Maximum full-load kW/ton rating, adjusted for nonstandard conditions.

$IPLV.IP$ = $IPLV.IP$ value from Table C403.3.2(3).

PLV_{adj} = Maximum $NPLV$ rating, adjusted for nonstandard conditions.

A = $0.00000014592 \times (LIFT)^4 - 0.0000346496 \times (LIFT)^3 + 0.00314196 \times (LIFT)^2 - 0.147199 \times (LIFT) + 3.93073$

B = $0.0015 \times L_{vg}E_{vap} + 0.934$

$LIFT$ = $L_{vg}Cond - L_{vg}E_{vap}$

$L_{vg}Cond$ = Full-load condenser leaving fluid temperature (°F).

$L_{vg}E_{vap}$ = Full-load evaporator leaving temperature (°F).

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The FL_{adj} and PLV_{adj} values are applicable only for centrifugal chillers meeting all of the following full-load design ranges:

- $36.00°F \leq L_{vg}E_{vap} \leq 60.00°F$
- $L_{vg}Cond \leq 115.00°F$
- $20.00°F \leq LIFT \leq 80.00°F$

Manufacturers shall calculate the FL_{adj} and PLV_{adj} before determining whether to label the chiller. Centrifugal chillers designed to operate outside of these ranges are not covered by this code.

C403.3.2.2 Positive displacement (air- and water-cooled) chilling packages. Equipment with a leaving fluid temperature higher than 32°F (0°C) and water-cooled positive displacement chilling packages with a condenser leaving fluid temperature below 115°F (46°C) shall meet the requirements of the tables in Section C403.3.2 when tested or certified with water at standard rating conditions, in accordance with the referenced test procedure.

C403.3.3 Hot gas bypass limitation. Cooling systems shall not use hot gas bypass or other evaporator pressure control systems unless the system is designed with multiple steps of unloading or continuous capacity modulation. The capacity of the hot gas bypass shall be limited as indicated in Table C403.3.3, as limited by Section C403.5.1.

TABLE C403.3.2(1)
ELECTRICALLY OPERATED UNITARY AIR CONDITIONERS AND CONDENSING UNITS—MINIMUM EFFICIENCY REQUIREMENTS[c, d]

EQUIPMENT TYPE	SIZE CATEGORY	HEADING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air conditioners, air cooled	< 65,000 Btu/h[b]	All	Split system, three phase and applications outside US single phase[b]	13.0 SEER before 1/1/2023 13.4 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single-package, three phase and applications outside US single phase[b]	14.0 SEER before 1/1/2023 13.4 SEER2 after 1/1/2023	
Space constrained, air cooled	≤ 30,000 Btu/h[b]	All	Split system, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 11.7 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single package, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 11.7 SEER2 after 1/1/2023	
Small duct, high velocity, air cooled	< 65,000 Btu/h[b]	All	Split system, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 12.1 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
Air conditioners, air cooled	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)	Split system and single package	11.2 EER 12.9 IEER before 1/1/2023 14.8 IEER after 1/1/2023	AHRI 340/360
		All other		11.0 EER 12.7 IEER before 1/1/2023 14.6 IEER after 1/1/2023	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric resistance (or none)		11.0 EER 12.4 IEER before 1/1/2023 14.2 IEER after 1/1/2023	
		All other		10.8 EER 12.2 IEER before 1/1/2023 14.0 IEER after 1/1/2023	

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TABLE C403.3.2(1)—continued
ELECTRICALLY OPERATED UNITARY AIR CONDITIONERS AND CONDENSING UNITS—MINIMUM EFFICIENCY REQUIREMENTS[c, d]

EQUIPMENT TYPE	SIZE CATEGORY	HEADING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air conditioners, air cooled *(continued)*	≥ 240,000 Btu/h and < 760,000 Btu/h	Electric resistance (or none)	Split system and single package	10.0 EER 11.6 IEER before 1/1/2023 13.2 IEER after 1/1/2023	AHRI 340/360
		All other		9.8 EER 11.4 IEER before 1/1/2023 13.0 IEER after 1/1/2023	
	≥ 760,000 Btu/h	Electric resistance (or none)		9.7 EER 11.2 IEER before 1/1/2023 12.5 IEER after 1/1/2023	
		All other		9.5 EER 11.0 IEER before 1/1/2023 12.3 IEER after 1/1/2023	
Air conditioners, water cooled	< 65,000 Btu/h	All	Split system and single package	12.1 EER 12.3 IEER	AHRI 210/240
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)		12.1 EER 13.9 IEER	AHRI 340/360
		All other		11.9 EER 13.7 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric resistance (or none)		12.5 EER 13.9 IEER	
		All other		12.3 EER 13.7 IEER	
	≥ 240,000 Btu/h and < 760,000 Btu/h	Electric resistance (or none)		12.4 EER 13.6 IEER	
		All other		12.2 EER 13.4 IEER	
	≥ 760,000 Btu/h	Electric resistance (or none)		12.2 EER 13.5 IEER	
		All other		12.0 EER 13.3 IEER	

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TABLE C403.3.2(1)—continued
ELECTRICALLY OPERATED UNITARY AIR CONDITIONERS AND CONDENSING UNITS—MINIMUM EFFICIENCY REQUIREMENTS[c, d]

EQUIPMENT TYPE	SIZE CATEGORY	HEADING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air conditioners, evaporatively cooled	< 65,000 Btu/h[b]	All	Split system and single package	12.1 EER 12.3 IEER	AHRI 210/240
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)		12.1 EER 12.3 IEER	AHRI 340/360
		All other		11.9 EER 12.1 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric resistance (or none)		12.0 EER 12.2 IEER	
		All other		11.8 EER 12.0 IEER	
	≥ 240,000 Btu/h and < 760,000 Btu/h	Electric resistance (or none)		11.9 EER 12.1 IEER	
		All other		11.7 EER 11.9 IEER	
	≥ 760,000 Btu/h	Electric resistance (or none)		11.7 EER 11.9 IEER	
		All other		11.5 EER 11.7 IEER	
Condensing units, air cooled	≥ 135,000 Btu/h	—	—	10.5 EER 11.8 IEER	AHRI 365
Condensing units, water cooled	≥ 135,000 Btu/h	—	—	13.5 EER 14.0 IEER	AHRI 365
Condensing units, evaporatively cooled	≥ 135,000 Btu/h	—	—	13.5 EER 14.0 IEER	AHRI 365

For SI: 1 British thermal unit per hour = 0.2931 W.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Single-phase, US air-cooled air conditioners less than 65,000 Btu/h are regulated as consumer products by the US Department of Energy Code of Federal Regulations DOE 10 CFR 430. SEER and SEER2 values for single-phase products are set by the US Department of Energy.

c. DOE 10 CFR 430 Subpart B Appendix M1 includes the test procedure updates effective 1/1/2023 that will be incorporated in AHRI 210/240—2023.

d. This table is a replica of ASHRAE 90.1 Table 6.8.1-1 Electrically Operated Unitary Air Conditioners and Condensing Units—Minimum Efficiency Requirements.

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TABLE C403.3.2(2)
ELECTRICALLY OPERATED AIR-COOLED UNITARY HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[c, d]

EQUIPMENT TYPE	SIZE CATEGORY	HEADING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air cooled (cooling mode)	< 66,000 Btu/h	All	Split system, three phase and applications outside US single phase[b]	14.0 SEER before 1/1/2023 14.3 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single package, three phase and applications outside US single phase[b]	14.0 SEER before 1/1/2023 13.4 SEER2 after 1/1/2023	
Space constrained, air cooled (cooling mode)	≤ 30,000 Btu/h	All	Split system, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 11.7 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single package, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 11.7 SEER2 after 1/1/2023	
Single duct, high velocity, air cooled (cooling mode)	< 65,000	All	Split system, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 12.0 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
Air cooled (cooling mode)	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)	Split system and single package	11.0 EER 12.2 IEER before 1/1/2023 14.1 IEER after 1/1/2023	AHRI 340/360
		All other		10.8 EER 12.0 IEER before 1/1/2023 13.9 IEER after 1/1/2023	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric resistance (or none)		10.6 EER 11.6 IEER before 1/1/2023 13.5 IEER after 1/1/2023	
		All other		10.4 EER 11.4 IEER before 1/1/2023 13.3 IEER after 1/1/2023	
	≥ 240,000 Btu/h	Electric resistance (or none)		9.5 EER 10.6 IEER before 1/1/2023 12.5 IEER after 1/1/2023	
		All other		9.3 EER 10.4 IEER before 1/1/2023 12.3 IEER after 1/1/2023	
Air cooled (heating mode)	< 65,000 Btu/h	All	Split system, three phase and applications outside US single phase[b]	8.2 HSPF before 1/1/2023 7.5 HSPF2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single package, three phase and applications outside US single phase[b]	8.0 HSPF before 1/1/2023 6.7 HSPF2 after 1/1/2023	

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TABLE C403.3.2(2)—continued
ELECTRICALLY OPERATED AIR-COOLED UNITARY HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[c, d]

EQUIPMENT TYPE	SIZE CATEGORY	HEADING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Space constrained, air cooled (heating mode)	≤ 30,000 Btu/h	All	Split system, three phase and applications outside US single phase[b]	7.4 HSPF before 1/1/2023 6.3 HSPF2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single package, three phase and applications outside US single phase[b]	7.4 HSPF before 1/1/2023 6.3 HSPF2 after 1/1/2023	
Small duct, high velocity, air cooled (heating mode)	< 65,000 Btu/h	All	Split system, three phase and applications outside US single phase[b]	7.2 HSPF before 1/1/2023 6.1 HSPF2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
Air cooled (heating mode)	≥ 65,000 Btu/h and < 135,000 Btu/h (cooling capacity)	All	47°F db/43°F wb outdoor air	3.30 COP_H before 1/1/2023 3.40 COP_H after 1/1/2023	AHRI 340/360
			17°F db/15°F wb outdoor air	2.25 COP_H	
	≥ 135,000 Btu/h and < 240,000 Btu/h (cooling capacity)		47°F db/43°F wb outdoor air	3.20 COP_H before 1/1/2023 3.30 SOP_H after 1/1/2023	
			17°F db/15°F wb outdoor air	2.05 COP_H	
	≥ 240,000 Btu/h (cooling capacity)		47°F db/43°F wb outdoor air	3.20 COP_H	
			17°F db/15°F wb outdoor air	2.05 COP_H	

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) – 32]/1.8, wb = wet bulb, db = dry bulb.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Single-phase, US air-cooled heat pumps less than 65,000 Btu/h are regulated as consumer products by the US Department of Energy Code of Federal Regulations DOE 10 CFR 430. SEER, SEER2 and HSPF values for single-phase products are set by the US Department of Energy.

c. DOE 10 CFR 430 Subpart B Appendix M1 includes the test procedure updates effective 1/1/2023 that will be incorporated in AHRI 210/240—2023.

d. This table is a replica of ASHRAE 90.1 Table 6.8.1-2 Electrically Operated Air-Cooled Unitary Heat Pumps—Minimum Efficiency Requirements.

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TABLE C403.3.2(3)
WATER-CHILLING PACKAGES—MINIMUM EFFICIENCY REQUIREMENTS[a, b, e, f]

EQUIPMENT TYPE	SIZE CATEGORY	UNITS	PATH A	PATH B	TEST PROCEDURE[c]
Air cooled chillers	< 150 tons	EER (Btu/Wh)	≥ 10.100 FL	≥ 9.700 FL	AHRI 550/590
			≥ 13.700 IPLV.IP	≥ 15.800 IPLV.IP	
	≥ 150 tons		≥ 10.100 FL	≥ 9.700FL	
			≥ 14.000 IPLV.IP	≥ 16.100 IPLV.IP	
Air cooled without condenser, electrically operated	All capacities	EER (Btu/Wh)	Air-cooled chillers without condenser must be rated with matching condensers and comply with air-cooled chiller efficiency requirements		AHRI 550/590
Water cooled, electrically operated positive displacement	< 75 tons	kW/ton	≤ 0.750 FL	≤ 0.780 FL	AHRI 550/590
			≤ 0.600 IPLV.IP	≤ 0.500 IPLV.IP	
	≥ 75 tons and < 150 tons		≤ 0.720 FL	≤ 0.750 FL	
			≤ 0.560 IPLV.IP	≤ 0.490 IPLV.IP	
	≥ 150 tons and < 300 tons		≤ 0.660 FL	≤ 0.680 FL	
			≤ 0.540 IPLV.IP	≤ 0.440 IPLV.IP	
	≥ 300 tons and < 600 tons		≤ 0.610 FL	≤ 0.625 FL	
			≤ 0.520 IPLV.IP	≤ 0.410 IPLV.IP	
	≥ 600 tons		≤ 0.560 FL	≤ 0.585 FL	
			≤ 0.500 IPLV.IP	≤ 0.380 IPLV.IP	
Water cooled, electrically operated centrifugal	< 150 tons	kW/ton	≤ 0.610 FL	≤ 0.695 FL	AHRI 550/590
			≤ 0.550 IPLV.IP	≤ 0.440 IPLV.IP	
			≤ 0.610 FL	≤ 0.635 FL	
			≤ 0.550 IPLV.IP	≤ 0.400 IPLV.IP	
	≥ 300 tons and < 400 tons		≤ 0.560 FL	≤ 0.595 FL	
			≤ 0.520 IPLV.IP	≤ 0.390 IPLV.IP	
	≥ 400 tons and < 600 tons		≤ 0.560 FL	≤ 0.585 FL	
			≤ 0.500 IPLV.IP	≤ 0.380 IPLV.IP	
	≥ 600 tons		≤ 0.560 FL	≤ 0.585 FL	
			≤ 0.500 IPLV.IP	≤ 0.380 IPLV.IP	
Air cooled absorption, single effect	All capacities	COP (W/W)	≥ 0.600 FL	NA[d]	AHRI 560
Water cooled absorption, single effect	All capacities	COP (W/W)	≥ 0.700 FL	NA[d]	AHRI 560
Absorption double effect, indirect fired	All capacities	COP (W/W)	≥ 1.000 FL	NA[d]	AHRI 560
			≥ 0.150 IPLV.IP		
Absorption double effect, direct fired	All capacities	COP (W/W)	≥ 1.000 FL	NA[d]	AHRI 560
			≥ 1.000 IPLV		

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b. The requirements for centrifugal chillers shall be adjusted for nonstandard rating conditions per Section C403.3.2.1 and are applicable only for the range of conditions listed there. The requirements for air-cooled, water-cooled positive displacement and absorption chillers are at standard rating conditions defined in the reference test procedure.
c. Both the full-load and IPLV.IP requirements must be met or exceeded to comply with this standard. When there is a Path B, compliance can be with either Path A or Path B for any application.
d. NA means the requirements are not applicable for Path B, and only Path A can be used for compliance.
e. FL is the full-load performance requirements, and IPLV.IP is for the part-load performance requirements.
f. This table is a replica of ASHRAE 90.1 Table 6.8.1-3 Water-Chilling Packages—Minimum Efficiency Requirements.

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TABLE C403.3.2(4)
ELECTRICALLY OPERATED PACKAGED TERMINAL AIR CONDITIONERS, PACKAGED TERMINAL HEAT PUMPS, SINGLE-PACKAGE VERTICAL AIR CONDITIONERS, SINGLE-PACKAGE VERTICAL HEAT PUMPS, ROOM AIR CONDITIONERS AND ROOM AIR-CONDITIONER HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[e]

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY[d]	TEST PROCEDURE[a]
PTAC (cooling mode) standard size	< 7,000 Btu/h	95°F db/75°F wb outdoor air[c]	11.9 EER	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		14.0 – (0.300 × Cap/1,000) EER[d]	
	> 15,000 Btu/h		9.5 EER	
PTAC (cooling mode) nonstandard size[a]	< 7,000 Btu/h	95°F db/75°F wb outdoor air[c]	9.4 EER	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		10.9 – (0.213 × Cap/1,000) EER[d]	
	> 15,000 Btu/h		7.7 EER	
PTHP (cooling mode) standard size	< 7,000 Btu/h	95°F db/75°F wb outdoor air[c]	11.9 EER	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		14.0 – (0.300 × Cap/1,000) EER[d]	
	> 15,000 Btu/h		9.5 EER	
PTHP (cooling mode) nonstandard size[b]	< 7,000 Btu/h	95°F db/75°F wb outdoor air[c]	9.3 EER	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		10.8 – (0.213 × Cap/1,000) EER[d]	
	> 15,000 Btu/h		7.6 EER	
PTHP (heating mode) standard size	< 7,000 Btu/h	47°F db/43°F wb outdoor air	3.3 COP_H	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		3.7 – (0.052 × Cap/1,000) COP_H[d]	
	> 15,000 Btu/h		2.90 COP_H	
PTHP (heating mode) nonstandard size[b]	< 7,000 Btu/h	47°F db/43°F wb outdoor air	2.7 COP_H	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		2.9 – (0.026 × Cap/1000) COP_H[d]	
	> 15,000 Btu/h		2.5 COP_H	
SPVAC (cooling mode) single and three phase	< 65,000 Btu/h	95°F db/75°F wb outdoor air[c]	11.0 EER	AHRI 390
	≥ 65,000 Btu/h and ≤ 135,000 Btu/h		10.0 EER	
	≥ 135,000 Btu/h and ≤ 240,000 Btu/h		10.0 EER	
SPVHP (cooling mode)	< 65,000 Btu/h	95°F db/75°F wb outdoor air[c]	11.0 EER	AHRI 390
	≥ 65,000 Btu/h and ≤ 135,000 Btu/h		10.0 EER	
	≥ 135,000 Btu/h and ≤ 240,000 Btu/h		10.1 EER	
SPVHP (heating mode)	< 65,000 Btu/h	47°F db/43°F wb outdoor air	3.3 COP_H	AHRI 390
	≥ 65,000 Btu/h and ≤ 135,000 Btu/h		3.0 COP_H	
	≥ 135,000 Btu/h and ≤ 240,000 Btu/h		3.0 COP_H	

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TABLE C403.3.2(4)—continued
ELECTRICALLY OPERATED PACKAGED TERMINAL AIR CONDITIONERS, PACKAGED TERMINAL HEAT PUMPS, SINGLE-PACKAGE VERTICAL AIR CONDITIONERS, SINGLE-PACKAGE VERTICAL HEAT PUMPS, ROOM AIR CONDITIONERS AND ROOM AIR-CONDITIONER HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[e]

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY[d]	TEST PROCEDURE[a]
Room air conditioners without reverse cycle with louvered sides for applications outside US	< 6,000 Btu/h	—	11.0 CEER	ANSI/AHAM RAC-1
	≥ 6,000 Btu/h and < 8,000 Btu/h	—	11.0 CEER	
	≥ 8,000 Btu/h and < 14,000 Btu/h	—	10.9 CEER	
	≥ 14,000 Btu/h and < 20,000 Btu/h	—	10.7 CEER	
	≥ 20,000 Btu/h and < 28,000 Btu/h	—	9.4 CEER	
	≥ 28,000 Btu/h	—	9.0 CEER	
Room air conditioners without louvered sides	< 6,000 Btu/h	—	10.0 CEER	ANSI/AHAM RAC-1
	≥ 6,000 Btu/h and < 8,000 Btu/h	—	10.0 CEER	
	≥ 8,000 Btu/h and < 11,000 Btu/h	—	9.6 CEER	
	≥ 11,000 Btu/h and < 14,000 Btu/h	—	9.5 CEER	
	≥ 14,000 Btu/h and < 20,000 Btu/h	—	9.3 CEER	
	≥ 20,000 Btu/h	—	9.4 CEER	
Room air conditioners with reverse cycle, with louvered sides for applications outside US	< 20,000 Btu/h	—	9.8 CEER	ANSI/AHAM RAC-1
	≥ 20,000 Btu/h	—	9.3 CEER	
Room air conditioners with reverse cycle without louvered sides for applications outside US	< 14,000 Btu/h	—	9.3 CEER	ANSI/AHAM RAC-1
	≥ 14,000 Btu/h	—	8.7 CEER	
Room air conditioners, casement only for applications outside US	All	—	9.5 CEER	ANSI/AHAM RAC-1
Room air conditioners, casement slider for applications outside US	All	—	10.4 CEER	ANSI/AHAM RAC-1

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) – 32]/1.8, wb = wet bulb, db = dry bulb.

"Cap" = The rated cooling capacity of the project in Btu/h. Where the unit's capacity is less than 7,000 Btu/h, use 7,000 Btu/h in the calculation. Where the unit's capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculations.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Nonstandard size units must be factory labeled as follows: "MANUFACTURED FOR NONSTANDARD SIZE APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW STANDARD PROJECTS." Nonstandard size efficiencies apply only to units being installed in existing sleeves having an external wall opening of less than 16 inches (406 mm) high or less than 42 inches (1067 mm) wide and having a cross-sectional area less than 670 square inches (0.43 m^2).

c. The cooling-mode wet bulb temperature requirement only applies for units that reject condensate to the condenser coil.

d. "Cap" in EER and COPH equations for PTACs and PTHPs means cooling capacity in Btu/h at 95°F outdoor dry-bulb temperature.

e. This table is a replica of ASHRAE 90.1 Table 6.8.1-4 Electrically Operated Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Single-Package Vertical Air Conditioners, Single-Package Vertical Heat Pumps, Room Air Conditioners, and Room Air-Conditioner Heat Pumps—Minimum Efficiency Requirements.

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TABLE C403.3.2(5)
WARM-AIR FURNACES AND COMBINATION WARM-AIR FURNACES/AIR-CONDITIONING UNITS, WARM-AIR DUCT FURNACES AND UNIT HEATERS—MINIMUM EFFICIENCY REQUIREMENTS[g]

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Warm-air furnace, gas fired for application outside the US	< 225,000 Btu/h	Maximum capacity[c]	80% AFUE (nonweatherized) or 81% AFUE (weatherized) or 80% E_t[b, d]	DOE 10 CFR 430 Appendix N or Section 2.39, Thermal Efficiency, ANSI Z21.47
Warm-air furnace, gas fired	< 225,000 Btu/h	Maximum capacity[c]	80% E_t[b, d] before 1/1/2023 81% E_t[d] after 1/1/2023	Section 2.39, Thermal Efficiency, ANSI Z21.47
Warm-air furnace, oil fired for application outside the US	< 225,000 Btu/h	Maximum capacity[c]	83% AFUE (nonweatherized) or 78% AFUE (weatherized) or 80% E_t[b, d]	DOE 10 CFR 430 Appendix N or Section 42, Combustion, UL 727
Warm-air furnace, oil fired	< 225,000 Btu/h	Maximum capacity[c]	80% E_t before 1/1/2023 82% E_t[d] after 1/1/2023	Section 42, Combustion, UL 727
Electric furnaces for applications outside the US	< 225,000 Btu/h	All	96% AFUE	DOE 10 CFR 430 Appendix N
Warm-air duct furnaces, gas fired	All capacities	Maximum capacity[c]	80% E_c[e]	Section 2.10, Efficiency, ANSI Z83.8
Warm-air unit heaters, gas fired	All capacities	Maximum capacity[c]	80% E_c[e, f]	Section 2.10, Efficiency, ANSI Z83.8
Warm-air unit heaters, oil fired	All capacities	Maximum capacity[c]	80% E_c[e, f]	Section 40, Combustion, UL 731

For SI: 1 British thermal unit per hour = 0.2931 W.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Combination units (i.e., furnaces contained within the same cabinet as an air conditioner) not covered by DOE 10 CFR 430 (i.e., three-phase power or with cooling capacity greater than or equal to 65,000 Btu/h) may comply with either rating. All other units greater than 225,000 Btu/h sold in the US must meet the AFUE standards for consumer products and test using USDOE's AFUE test procedure at DOE 10 CFR 430, Subpart B, Appendix N.

c. Compliance of multiple firing rate units shall be at the maximum firing rate.

d. E_t = thermal efficiency. Units must also include an interrupted or intermittent ignition device (IID), have jacket losses not exceeding 0.75 percent of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.

e. E_c = combustion efficiency (100 percent less flue losses). See test procedure for detailed discussion.

f. Units must also include an interrupted or intermittent ignition device (IID) and have either power venting or an automatic flue damper.

g. This table is a replica of ASHRAE 90.1 Table 6.8.1-5 Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units, Warm-Air Duct Furnaces, and Unit Heaters—Minimum Efficiency Requirements.

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TABLE C403.3.2(6)
GAS- AND OIL-FIRED BOILERS—MINIMUM EFFICIENCY REQUIREMENTS[i]

EQUIPMENT TYPE[b]	SUBCATEGORY OR RATING CONDITION	SIZE CATEGORY (INPUT)	MINIMUM EFFICIENCY	EFFICIENCY AS OF 3/2/2022	TEST PROCEDURE[a]
Boilers, hot water	Gas fired	< 300,000 Btu/h[g, h] for applications outside US	82% AFUE	82% AFUE	DOE 10 CFR 430 Appendix N
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	80% E_t[d]	80% E_t[d]	DOE 10 CFR 431.86
		> 2,500,000 Btu/h[b]	82% E_c[c]	82% E_c[c]	
	Oil fired[f]	< 300,000 Btu/h[g,h] for applications outside US	84% AFUE	84% AFUE	DOE 10 CFR 430 Appendix N
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	82% E_t[d]	82% E_t[d]	DOE 10 CFR 431.86
		> 2,500,000 Btu/h[b]	84% E_c[c]	84% E_c[c]	
Boilers, steam	Gas fired	< 300,000 Btu/h[g] for applications outside US	80% AFUE	80% AFUE	DOE 10 CFR 430 Appendix N
	Gas fired—all, except natural draft	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	79% E_t[d]	79% E_t[d]	DOE 10 CFR 431.86
		> 2,500,000 Btu/h[b]	79% E_t[d]	79% E_t[d]	
	Gas fired—natural draft	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	77% E_t[d]	79% E_t[d]	
		> 2,500,000 Btu/h[b]	77% E_t[d]	79% E_t[d]	
	Oil fired[f]	< 300,000 Btu/h[g] for applications outside US	82% AFUE	82% AFUE	DOE 10 CFR 430 Appendix N
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	81% E_t[d]	81% E_t[d]	DOE 10 CFR 431.86
		> 2,500,000 Btu/h[b]	81% E_t[d]	81% E_t[d]	

For SI: 1 British thermal unit per hour = 0.2931 W.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.

c. E_c = Combustion efficiency (100 percent less flue losses).

d. E_t = Thermal efficiency.

e. Maximum capacity—minimum and maximum ratings as provided for and allowed by the unit's controls.

f. Includes oil-fired (residual).

g. Boilers shall not be equipped with a constant burning pilot light.

h. A boiler not equipped with a tankless domestic water-heating coil shall be equipped with an automatic means for adjusting the temperature of the water such that an incremental change in inferred heat load produces a corresponding incremental change in the temperature of the water supplied.

i. This table is a replica of ASHRAE 90.1 Table 6.8.1-6 Gas- and Oil-Fired Boilers—Minimum Efficiency Requirements.

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TABLE C403.3.2(7)
PERFORMANCE REQUIREMENTS FOR HEAT REJECTION EQUIPMENT—MINIMUM EFFICIENCY REQUIREMENTS[i]

EQUIPMENT TYPE	TOTAL SYSTEM HEAT-REJECTION CAPACITY AT RATED CONDITIONS	SUBCATEGORY OR RATING CONDITION[h]	PERFORMANCE REQUIRED[b, c, d, f, g]	TEST PROCEDURE[a, e]
Propeller or axial fan open-circuit cooling towers	All	95°F entering water 85°F leaving water 75°F entering wb	≥ 40.2 gpm/hp	CTI ATC-105 and CTI STD-201 RS
Centrifugal fan open-circuit cooling towers	All	95°F entering water 85°F leaving water 75°F entering wb	≥ 20.0 gpm/hp	CTI ATC-105 and CTI STD-201 RS
Propeller or axial fan closed-circuit cooling towers	All	102°F entering water 90°F leaving water 75°F entering wb	≥ 16.1 gpm/hp	CTI ATC-105S and CTI STD-201 RS
Centrifugal fan closed-circuit cooling towers	All	102°F entering water 90°F leaving water 75°F entering wb	≥ 7.0 gpm/hp	CTI ATC-105S and CTI STD-201 RS
Propeller or axial fan dry coolers (air-cooled fluid coolers)	All	115°F entering water 105°F leaving water 95°F entering wb	≥ 4.5 gpm/hp	CTI ATC-105DS
Propeller or axial fan evaporative condensers	All	R-448A test fluid 165°F entering gas temperature 105°F condensing temperature 75°F entering wb	≥ 160,000 Btu/h × hp	CTI ATC-106
Propeller or axial fan evaporative condensers	All	Ammonia test fluid 140°F entering gas temperature 96.3°F condensing temperature 75°F entering wb	≥ 134,000 Btu/h × hp	CTI ATC-106
Centrifugal fan evaporative condensers	All	R-448A test fluid 165°F entering gas temperature 105°F condensing temperature 75°F entering wb	≥ 137,000 Btu/h × hp	CTI ATC-106
Centrifugal fan evaporative condensers	All	Ammonia test fluid 140°F entering gas temperature 96.3°F condensing temperature 75°F entering wb	≥ 110,000 Btu/h × hp	CTI ATC-106
Air-cooled condensers	All	125°F condensing temperature 190°F entering gas temperature 15°F subcooling 95°F entering db	≥ 176,000 Btu/h × hp	AHRI 460

For SI: °C = [(°F) – 32]/1.8, L/s × kW = (gpm/hp)/(11.83), COP = (Btu/h × hp)/(2550.7), db = dry bulb temperature, wb = wet bulb temperature.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. For purposes of this table, open-circuit cooling tower performance is defined as the water-flow rating of the tower at the thermal rating condition listed in the table divided by the fan motor nameplate power.

c. For purposes of this table, closed-circuit cooling tower performance is defined as the process water-flow rating of the tower at the thermal rating condition listed in the table divided by the sum of the fan motor nameplate power and the integral spray pump motor nameplate power.

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TABLE C403.3.2(7)—continued
PERFORMANCE REQUIREMENTS FOR HEAT REJECTION EQUIPMENT—MINIMUM EFFICIENCY REQUIREMENTS[i]

d. For purposes of this table, dry-cooler performance is defined as the process water-flow rating of the unit at the thermal rating condition listed in the table divided by the total fan motor nameplate power of the unit, and air-cooled condenser performance is defined as the heat rejected from the refrigerant divided by the total fan motor nameplate power of the unit.
e. The efficiencies and test procedures for both open- and closed-circuit cooling towers are not applicable to hybrid cooling towers that contain a combination of separate wet and dry heat exchange sections. The certification requirements do not apply to field-erected cooling towers.
f. All cooling towers shall comply with the minimum efficiency listed in the table for that specific type of tower with the capacity effect of any project-specific accessories and/or options included in the capacity of the cooling tower.
g. For purposes of this table, evaporative condenser performance is defined as the heat rejected at the specified rating condition in the table, divided by the sum of the fan motor nameplate power and the integral spray pump nameplate power.
h. Requirements for evaporative condensers are listed with ammonia (R-717) and R-448A as test fluids in the table. Evaporative condensers intended for use with halocarbon refrigerants other than R-448A must meet the minimum efficiency requirements listed with R-448A as the test fluid. For ammonia, the condensing temperature is defined as the saturation temperature corresponding to the refrigerant pressure at the condenser entrance. For R-448A, which is a zeotropic refrigerant, the condensing temperature is defined as the arithmetic average of the dew point and the bubble point temperatures corresponding to the refrigerant pressure at the condenser entrance.
i. This table is a replica of ASHRAE 90.1 Table 6.8.1-7 Performance Requirements for Heat Rejection Equipment—Minimum Efficiency Requirements.

TABLE C403.3.2(8)
ELECTRICALLY OPERATED VARIABLE-REFRIGERANT-FLOW AIR CONDITIONERS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SIZE CATEGORY	HEATING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
VRF air conditioners, air cooled	< 65,000 Btu/h	All	VRF multisplit system	13.0 SEER	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)	VRF multisplit system	11.2 EER 13.1 IEER 15.5 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric resistance (or none)	VRF multisplit system	11.0 EER 12.9 IEER 14.9 IEER	
	≥ 240,000 Btu/h	Electric resistance (or none)	VRF multisplit system	10.0 EER 11.6 IEER 13.9 IEER	

For SI: 1 British thermal unit per hour = 0.2931 W.
a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b. This table is a replica of ASHRAE 90.1 Table 6.8.1-8 Electrically Operated Variable-Refrigerant-Flow Air Conditioners—Minimum Efficiency Requirements.

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TABLE C403.3.2(9)
ELECTRICALLY OPERATED VARIABLE-REFRIGERANT-FLOW AND APPLIED HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SIZE CATEGORY	HEATING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
VRF air cooled (cooling mode)	< 65,000 Btu/h	All	VRF multisplit system	13.0 SEER	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)	VRF multisplit system	11.0 EER 12.9 IEER 14.6 IEER	
			VRF multisplit system with heat recovery	10.8 EER 12.7 IEER 14.4 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h		VRF multisplit system	10.6 EER 12.3 IEER 13.9 IEER	
			VRF multisplit system with heat recovery	10.4 EER 12.1 IEER 13.7 IEER	
	≥ 240,000 Btu/h		VRF multisplit system	9.5 EER 11.0 IEER 12.7 IEER	
			VRF multisplit system with heat recovery	9.3 EER 10.8 IEER 12.5 IEER	
VRF water source (cooling mode)	< 65,000 Btu/h	All	VRF multisplit systems 86°F entering water	12.0 EER 16.0 IEER	AHRI 1230
			VRF multisplit systems with heat recovery 86°F entering water	11.8 EER 15.8 IEER	
	≥ 65,000 Btu/h and < 135,000 Btu/h		VRF multisplit system 86°F entering water	12.0 EER 16.0 IEER	
			VRF multisplit system with heat recovery 86°F entering water	11.8 EER 15.8 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h		VRF multisplit system 86°F entering water	10.0 EER 14.0 IEER	
			VRF multisplit system with heat recovery 86°F entering water	9.8 EER 13.8 IEER	
	≥ 240,000 Btu/h		VRF multisplit system 86°F entering water	10.0 EER 12.0 IEER	
			VRF multisplit system with heat recovery 86°F entering water	9.8 EER 11.8 IEER	
VRF groundwater source (cooling mode)	< 135,000 Btu/h	All	VRF multisplit system 59°F entering water	16.2 EER	AHRI 1230
			VRF multisplit system with heat recovery 59°F entering water	16.0 EER	
	≥ 135,000 Btu/h		VRF multisplit system 59°F entering water	13.8 EER	
			VRF multisplit system with heat recovery 59°F entering water	13.6 EER	

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TABLE C403.3.2(9)—continued
ELECTRICALLY OPERATED VARIABLE-REFRIGERANT-FLOW AND APPLIED HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SIZE CATEGORY	HEATING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
VRF ground source (cooling mode)	< 135,000 Btu/h	All	VRF multisplit system 77°F entering water	13.4 EER	AHRI 1230
			VRF multisplit system with heat recovery 77°F entering water	13.2 EER	
	≥ 135,000 Btu/h		VRF multisplit system 77°F entering water	11.0 EER	
			VRF multisplit system with heat recovery 77°F entering water	10.8 EER	
VRF air cooled (heating mode)	< 65,000 Btu/h (cooling capacity)		VRF multisplit system	7.7 HSPF	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h (cooling capacity)		VRF multisplit system 47°F db/43°F wb outdoor air	3.3 COP_H	
			17°F db/15°F wb outdoor air	2.25 COP_H	
	≥ 135,000 Btu/h (cooling capacity)		VRF multisplit system 47°F db/43°F wb outdoor air	3.2 COP_H	
			17°F db/15°F wb outdoor air	2.05 COP_H	
VRF water source (heating mode)	< 65,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	4.2 COP_H 4.3 COP_H	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	4.2 COP_H 4.3 COP_H	
	≥ 135,000 Btu/h and < 240,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	3.9 COP_H 4.0 COP_H	
	≥ 240,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	3.9 COP_H	
VRF groundwater source (heating mode)	< 135,000 Btu/h (cooling capacity)		VRF multisplit system 50°F entering water	3.6 COP_H	AHRI 1230
	≥ 135,000 Btu/h (cooling capacity)		VRF multisplit system 50°F entering water	3.3 COP_H	
VRF ground source (heating mode)	< 135,000 Btu/h (cooling capacity)		VRF multisplit system 32°F entering water	3.1 COP_H	AHRI 1230
	≥ 135,000 Btu/h (cooling capacity)		VRF multisplit system 32°F entering water	2.8 COP_H	

For SI: °C = [(°F) – 32]/1.8, 1 British thermal unit per hour = 0.2931 W, db = dry bulb temperature, wb = wet bulb temperature.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. This table is a replica of ASHRAE 90.1 Table 6.8.1-9 Electrically Operated Variable-Refrigerant-Flow and Applied Heat Pumps—Minimum Efficiency Requirements.

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TABLE C403.3.2(10)
FLOOR-MOUNTED AIR CONDITIONERS AND CONDENSING UNITS SERVING COMPUTER ROOMS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	STANDARD MODEL	NET SENSIBLE COOLING CAPACITY	MINIMUM NET SENSIBLE COP	RATING CONDITIONS RETURN AIR (dry bulb/dew point)	TEST PROCEDURE[a]
Air cooled	Downflow	< 80,000 Btu/h	2.70	85°F/52°F (Class 2)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.58		
		≥ 295,000 Btu/h	2.36		
	Upflow—ducted	< 80,000 Btu/h	2.67		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.55		
		≥ 295,000 Btu/h	2.33		
	Upflow—nonducted	< 65,000 Btu/h	2.16	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.04		
		≥ 240,000 Btu/h	1.89		
	Horizontal	< 65,000 Btu/h	2.65	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.55		
		≥ 240,000 Btu/h	2.47		
Air cooled with fluid economizer	Downflow	< 80,000 Btu/h	2.70	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.58		
		≥ 295,000 Btu/h	2.36		
	Upflow—ducted	< 80,000 Btu/h	2.67		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.55		
		≥ 295,000 Btu/h	2.33		
	Upflow—nonducted	< 65,000 Btu/h	2.09	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	1.99		
		≥ 240,000 Btu/h	1.81		
	Horizontal	< 65,000 Btu/h	2.65	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.55		
		≥ 240,000 Btu/h	2.47		
Water cooled	Downflow	< 80,000 Btu/h	2.82	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.73		
		≥ 295,000 Btu/h	2.67		
	Upflow—ducted	< 80,000 Btu/h	2.79		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.70		
		≥ 295,000 Btu/h	2.64		
	Upflow—nonducted	< 65,000 Btu/h	2.43	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.32		
		≥ 240,000 Btu/h	2.20		
	Horizontal	< 65,000 Btu/h	2.79	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.68		
		≥ 240,000 Btu/h	2.60		

(continued)

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TABLE C403.3.2(10)—continued
FLOOR-MOUNTED AIR CONDITIONERS AND CONDENSING UNITS SERVING COMPUTER ROOMS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	STANDARD MODEL	NET SENSIBLE COOLING CAPACITY	MINIMUM NET SENSIBLE COP	RATING CONDITIONS RETURN AIR (dry bulb/dew point)	TEST PROCEDURE[a]
Water cooled with fluid economizer	Downflow	< 80,000 Btu/h	2.77	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.68		
		≥ 295,000 Btu/h	2.61		
	Upflow—ducted	< 80,000 Btu/h	2.74		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.65		
		≥ 295,000 Btu/h	2.58		
	Upflow—nonducted	< 65,000 Btu/h	2.35	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.24		
		≥ 240,000 Btu/h	2.12		
	Horizontal	< 65,000 Btu/h	2.71	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.60		
		≥ 240,000 Btu/h	2.54		
Glycol cooled	Downflow	< 80,000 Btu/h	2.56	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.24		
		≥ 295,000 Btu/h	2.21		
	Upflow—ducted	< 80,000 Btu/h	2.53		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.21		
		≥ 295,000 Btu/h	2.18		
	Upflow, nonducted	< 65,000 Btu/h	2.08	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	1.90		
		≥ 240,000 Btu/h	1.81		
	Horizontal	< 65,000 Btu/h	2.48	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.18		
		≥ 240,000 Btu/h	2.18		
Glycol cooled with fluid economizer	Downflow	< 80,000 Btu/h	2.51	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.19		
		≥ 295,000 Btu/h	2.15		
	Upflow—ducted	< 80,000 Btu/h	2.48		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.16		
		≥ 295,000 Btu/h	2.12		
	Upflow—nonducted	< 65,000 Btu/h	2.00	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	1.82		
		≥ 240,000 Btu/h	1.73		
	Horizontal	< 65,000 Btu/h	2.44	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.10		
		≥ 240,000 Btu/h	2.10		

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) – 32]/1.8, COP = (Btu/h × hp)/(2,550.7).

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. This table is a replica of ASHRAE 90.1 Table 6.8.1-10 Floor-Mounted Air Conditioners and Condensing Units Serving Computer Rooms—Minimum Efficiency Requirements.

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TABLE C403.3.2(11)
VAPOR-COMPRESSION-BASED INDOOR POOL DEHUMIDIFIERS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Single package indoor (with or without economizer)	Rating Conditions: A or C	3.5 MRE	AHRI 910
Single package indoor water cooled (with or without economizer)	Rating Conditions: A, B or C	3.5 MRE	
Single package indoor air cooled (with or without economizer)	Rating Conditions: A, B or C	3.5 MRE	
Split system indoor air cooled (with or without economizer)	Rating Conditions: A, B or C	3.5 MRE	

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b. This table is a replica of ASHRAE 90.1 Table 6.8.1-12 Vapor-Compression-Based Indoor Pool Dehumidifiers—Minimum Efficiency Requirements.

TABLE C403.3.2(12)
ELECTRICALLY OPERATED DX-DOAS UNITS, SINGLE-PACKAGE AND REMOTE CONDENSER, WITHOUT ENERGY RECOVERY—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air cooled (dehumidification mode)	—	4.0 ISMRE	AHRI 920
Air-source heat pumps (dehumidification mode)	—	4.0 ISMRE	AHRI 920
Water cooled (dehumidification mode)	Cooling tower condenser water	4.9 ISMRE	AHRI 920
	Chilled water	6.0 ISMRE	
Air-source heat pump (heating mode)	—	2.7 ISCOP	AHRI 920
Water-source heat pump (dehumidification mode)	Ground source, closed loop	4.8 ISMRE	AHRI 920
	Ground-water source	5.0 ISMRE	
	Water source	4.0 ISMRE	
Water-source heat pump (heating mode)	Ground source, closed loop	2.0 ISCOP	AHRI 920
	Ground-water source	3.2 ISCOP	
	Water source	3.5 ISCOP	

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b. This table is a replica of ASHRAE 90.1 Table 6.8.1-13 Electrically Operated DX-DOAS Units, Single-Package and Remote Condenser, without Energy Recovery—Minimum Efficiency Requirements.

TABLE C403.3.2(13)
ELECTRICALLY OPERATED DX-DOAS UNITS, SINGLE-PACKAGE AND REMOTE CONDENSER, WITH ENERGY RECOVERY—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air cooled (dehumidification mode)	—	5.2 ISMRE	AHRI 920
Air-source heat pumps (dehumidification mode)	—	5.2 ISMRE	AHRI 920
Water cooled (dehumidification mode)	Cooling tower condenser water	5.3 ISMRE	AHRI 920
	Chilled water	6.6 ISMRE	
Air-source heat pump (heating mode)	—	3.3 ISCOP	AHRI 920
Water-source heat pump (dehumidification mode)	Ground source, closed loop	5.2 ISMRE	AHRI 920
	Ground-water source	5.8 ISMRE	
	Water source	4.8 ISMRE	
Water-source heat pump (heating mode)	Ground source, closed loop	3.8 ISCOP	AHRI 920
	Ground-water source	4.0 ISCOP	
	Water source	4.8 ISCOP	

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b. This table is a replica of ASHRAE 90.1 Table 6.8.1-14 Electrically Operated DX-DOAS Units, Single-Package and Remote Condenser, with Energy Recovery—Minimum Efficiency Requirements.

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TABLE C403.3.2(14)
ELECTRICALLY OPERATED WATER-SOURCE HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[c]

EQUIPMENT TYPE	SIZE CATEGORY[b]	HEATING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Water-to-air, water loop (cooling mode)	< 17,000 Btu/h	All	86°F entering water	12.2 EER	ISO 13256-1
	≥ 17,000 Btu/h and < 65,000 Btu/h			13.0 EER	
	≥ 65,000 Btu/h and < 135,000 Btu/h			13.0 EER	
Water-to-air, ground water (cooling mode)	< 135,000 Btu/h	All	59°F entering water	18.0 EER	ISO 13256-1
Brine-to-air, ground loop (cooling mode)	< 135,000 Btu/h	All	77°F entering water	14.1 EER	ISO 13256-1
Water-to-water, water loop (cooling mode)	< 135,000 Btu/h	All	86°F entering water	10.6 EER	ISO 13256-2
Water-to-water, ground water (cooling mode)	< 135,000 Btu/h	All	59°F entering water	16.3 EER	ISO 13256-2
Brine-to-water, ground loop (cooling mode)	< 135,000 Btu/h	All	77°F entering water	12.1 EER	ISO 13256-2
Water-to-water, water loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	68°F entering water	4.3 COP_H	ISO 13256-1
Water-to-air, ground water (heating mode)	< 135,000 Btu/h (cooling capacity)	—	50°F entering water	3.7 COP_H	ISO 13256-1
Brine-to-air, ground loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	32°F entering water	3.2 COP_H	ISO 13256-1
Water-to-water, water loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	68°F entering water	3.7 COP_H	ISO 13256-1
Water-to-water, ground water (heating mode)	< 135,000 Btu/h (cooling capacity)	—	50°F entering water	3.1 COP_H	ISO 13256-2
Brine-to-water, ground loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	32°F entering water	2.5 COP_H	ISO 13256-2

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) – 32]/1.8.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Single-phase, US air-cooled heat pumps less than 19 kW are regulated as consumer products by DOE 10 CFR 430. SCOPC, SCOP2C, SCOPH and SCOP2H values for single-phase products are set by the USDOE.

c. This table is a replica of ASHRAE 90.1 Table 6.8.1-15 Electrically Operated Water-Source Heat Pumps—Minimum Efficiency Requirements.

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TABLE C403.3.2(15)
HEAT-PUMP AND HEAT RECOVERY CHILLER PACKAGES—MINIMUM EFFICIENCY REQUIREMENTS[g]

HEATING OPERATION													
EQUIPMENT TYPE	SIZE CATEGORY, ton_R	COOLING-ONLY OPERATION COOLING EFFICIENCY[c] AIR-SOURCE EER (FL/IPLV), Btu/W × h WATER-SOURCE POWER INPUT PER CAPACITY (FL/IPLV), kW/ton_R		HEATING SOURCE CONDITIONS (entering/ leaving water) OR OAT (db/wb), °F	HEAT-PUMP HEATING FULL-LOAD EFFICIENCY (COP_H)[b], W/W				HEAT RECOVERY CHILLER FULL-LOAD EFFICIENCY (COP_{HR})[c,d], W/W SIMULTANEOUS COOLING AND HEATING FULL-LOAD EFFICIENCY (COP_{SHC})[c], W/W				Test Procedure[a]
					Leaving Heating Water Temperature				Leaving Heating Water Temperature				
					Low	Medium	High	Boost	Low	Medium	High	Boost	
		Path A	Path B		105°F	120°F	140°F	140°F	105°F	120°F	140°F	140°F	
Air source	All sizes	≥ 9.595 FL ≥ 13.02 IPLV.IP	≥ 9.215 FL ≥ 15.01 IPLV.IP	47 db 43 wb[e]	≥ 3.290	≥ 2.770	≥ 2.310	NA	NA	NA	NA	NA	AHRI 550/590
		≥ 9.595 FL ≥ 13.30 IPLV.IP	≥ 9.215 FL ≥ 15.30 IPLV.IP	17 db 15 wb[e]	≥ 2.230	≥ 1.950	≥ 1.630	NA	NA	NA	NA	NA	
Water-source electrically operated positive displacement	< 75	≤ 0.7885 FL ≤ 0.6316 IPLV.IP	≤ 0.7875 FL ≤ 0.5145 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	AHRI 550/590
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	6.150	
	≥ 75 and < 150	≤ 0.7579 FL ≤ 0.5895 IPLV.IP	≤ 0.7140 FL ≤ 0.4620 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	6.150	
	≥ 150 and < 300	≤ 0.6947 FL ≤ 0.5684 IPLV.IP	≤ 0.7140 FL ≤ 0.4620 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	6.150	
	≥ 300 and < 600	≤ 0.6421 FL ≤ 0.5474 IPLV.IP	≤ 0.6563 FL ≤ 0.4305 IPLV.IP	54/44[f]	≥ 4.930	≥ 3.960	≥ 2.970	NA	≥ 8.900	≥ 6.980	≥ 5.000	NA	
				75/65[f]	NA	NA	NA	≥ 3.900	NA	NA	NA	6.850	
	≥ 600	≤ 0.5895 FL ≤ 0.5263 IPLV.IP	≤ 0.6143 FL ≤ 0.3990 IPLV.IP	54/44[f]	≥ 4.930	≥ 3.960	≥ 2.970	NA	≥ 8.900	≥ 6.980	≥ 5.000	NA	
				75/65[f]	NA	NA	NA	≥ 3.900	NA	NA	NA	6.850	
Water-source electrically operated centrifugal	< 75	≤ 0.6421 FL ≤ 0.5789 IPLV.IP	≤ 0.7316 FL ≤ 0.4632 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	AHRI 550/590
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	≥ 6.150	
	≥ 75 and < 150	≤ 0.5895 FL ≤ 0.5474 IPLV.IP	≤ 0.6684 FL ≤ 0.4211 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	≥ 6.150	
	≥ 150 and < 300	≤ 0.5895 FL ≤ 0.5263 IPLV.IP	≤ 0.6263 FL ≤ 0.4105 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	≥ 6.150	
	≥ 300 and < 600	≤ 0.5895 FL ≤ 0.5263 IPLV.IP	≤ 0.6158 FL ≤ 0.4000 IPLV.IP	54/44[f]	≥ 4.930	≥ 3.960	≥ 2.970	NA	≥ 8.900	≥ 6.980	≥ 5.000	NA	
				75/65[f]	NA	NA	NA	≥ 3.900	NA	NA	NA	≥ 6.850	
	≥ 600	≤ 0.5895 FL ≤ 0.5263 IPLV.IP	≤ 0.6158 FL ≤ 0.4000 IPLV.IP	54/44[f]	≥ 4.930	≥ 3.960	≥ 2.970	NA	≥ 8.900	≥ 6.980	≥ 5.000	NA	
				75/65[f]	NA	NA	NA	≥ 3.900	NA	NA	NA	≥ 6.850	

For SI: °C = [(°F) – 32]/1.8.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Cooling-only rating conditions are standard rating conditions defined in AHRI 550/590, Table 1.

c. Heating full-load rating conditions are at rating conditions defined in AHRI 550/590, Table 1.

d. For water-cooled heat recovery chillers that have capabilities for heat rejection to a heat recovery condenser and a tower condenser, the COP_{HR} applies to operation at full load with 100 percent heat recovery (no tower rejection). Units that only have capabilities for partial heat recovery shall meet the requirements of Table C403.3.2(3).

e. Outdoor air entering dry-bulb (db) temperature and wet-bulb (wb) temperature.

f. Source-water entering and leaving water temperature.

g. This table is a replica of ASHRAE 90.1 Table 6.8.1-16 Heat-Pump and Heat Recovery Chiller Packages—Minimum Efficiency Requirements.

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TABLE C403.3.2(16)
CEILING-MOUNTED COMPUTER-ROOM AIR CONDITIONERS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	STANDARD MODEL	NET SENSIBLE COOLING CAPACITY	MINIMUM NET SENSIBLE COP	RATING CONDITIONS RETURN AIR (dry bulb/dew point)	TEST PROCEDURE[a]
Air cooled with free air discharge condenser	Ducted	< 29,000 Btu/h	2.05	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.02		
		≥ 65,000 Btu/h	1.92		
	Nonducted	< 29,000 Btu/h	2.08		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.05		
		≥ 65,000 Btu/h	1.94		
Air cooled with free air discharge condenser with fluid economizer	Ducted	< 29,000 Btu/h	2.01	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.97		
		≥ 65,000 Btu/h	1.87		
	Nonducted	< 29,000 Btu/h	2.04		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.00		
		≥ 65,000 Btu/h	1.89		
Air cooled with ducted condenser	Ducted	< 29,000 Btu/h	1.86	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.83		
		≥ 65,000 Btu/h	1.73		
	Nonducted	< 29,000 Btu/h	1.89		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.86		
		≥ 65,000 Btu/h	1.75		
Air cooled with fluid economizer and ducted condenser	Ducted	< 29,000 Btu/h	1.82	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.78		
		≥ 65,000 Btu/h	1.68		
	Nonducted	< 29,000 Btu/h	1.85		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.81		
		≥ 65,000 Btu/h	1.70		
Water cooled	Ducted	< 29,000 Btu/h	2.38	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.28		
		≥ 65,000 Btu/h	2.18		
	Nonducted	< 29,000 Btu/h	2.41		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.31		
		≥ 65,000 Btu/h	2.20		

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TABLE C403.3.2(16)—continued
CEILING-MOUNTED COMPUTER-ROOM AIR CONDITIONERS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	STANDARD MODEL	NET SENSIBLE COOLING CAPACITY	MINIMUM NET SENSIBLE COP	RATING CONDITIONS RETURN AIR (dry bulb/dew point)	TEST PROCEDURE[a]
Water cooled with fluid economizer	Ducted	< 29,000 Btu/h	2.33	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.23		
		≥ 65,000 Btu/h	2.13		
	Nonducted	< 29,000 Btu/h	2.36		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.26		
		≥ 65,000 Btu/h	2.16		
Glycol cooled	Ducted	< 29,000 Btu/h	1.97	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.93		
		≥ 65,000 Btu/h	1.78		
	Nonducted	< 29,000 Btu/h	2.00		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.98		
		≥ 65,000 Btu/h	1.81		
Glycol cooled with fluid economizer	Ducted	< 29,000 Btu/h	1.92	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.88		
		≥ 65,000 Btu/h	1.73		
	Nonducted	< 29,000 Btu/h	1.95		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.93		
		≥ 65,000 Btu/h	1.76		

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) – 32]/1.8, COP = (Btu/h × hp)/(2,550.7).

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. This is a replica of ASHRAE 90.1 Table 6.8.1-17 Ceiling-Mounted Computer-Room Air Conditioners—Minimum Efficiency Requirements.

TABLE C403.3.3
MAXIMUM HOT GAS BYPASS CAPACITY

RATED CAPACITY	MAXIMUM HOT GAS BYPASS CAPACITY (% of total capacity)
≤ 240,000 Btu/h	50
> 240,000 Btu/h	25

For SI: 1 British thermal unit per hour = 0.2931 W.

C403.3.4 Boiler turndown. *Boiler systems* with design input of greater than 1,000,000 Btu/h (293 kW) shall comply with the turndown ratio specified in Table C403.3.4.

The system turndown requirement shall be met through the use of multiple single-input boilers, one or more *modulating boilers* or a combination of single-input and *modulating boilers*.

TABLE C403.3.4
BOILER TURNDOWN

BOILER SYSTEM DESIGN INPUT (Btu/h)	MINIMUM TURNDOWN RATIO
≥ 1,000,000 and ≤ 5,000,000	3 to 1
> 5,000,000 and ≤ 10,000,000	4 to 1
> 10,000,000	5 to 1

For SI: 1 British thermal unit per hour = 0.2931 W.

C403.4 Heating and cooling system controls. Each heating and cooling system shall be provided with controls in accordance with Sections C403.4.1 through C403.4.5.

C403.4.1 Thermostatic controls. The supply of heating and cooling energy to each *zone* shall be controlled by individual thermostatic controls capable of responding to temperature within the *zone*. Where humidification or dehumidification or both is provided, not fewer than one

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humidity control device shall be provided for each humidity control system.

Exception: Independent perimeter systems that are designed to offset only building envelope heat losses, gains or both serving one or more perimeter *zones* also served by an interior system provided that both of the following conditions are met:

1. The perimeter system includes not fewer than one thermostatic control *zone* for each building exposure having exterior walls facing only one orientation (within ±45 degrees) (0.8 rad) for more than 50 contiguous feet (15 240 mm).
2. The perimeter system heating and cooling supply is controlled by thermostats located within the *zones* served by the system.

C403.4.1.1 Heat pump supplementary heat. Heat pumps having supplementary electric resistance heat shall have controls that limit supplemental heat operation to only those times when one of the following applies:

1. The vapor compression cycle cannot provide the necessary heating energy to satisfy the thermostat setting.
2. The heat pump is operating in defrost mode.
3. The vapor compression cycle malfunctions.
4. The thermostat malfunctions.

C403.4.1.2 Deadband. Where used to control both heating and cooling, *zone* thermostatic controls shall be configured to provide a temperature range or deadband of not less than 5°F (2.8°C) within which the supply of heating and cooling energy to the *zone* is shut off or reduced to a minimum.

Exceptions:

1. Thermostats requiring manual changeover between heating and cooling modes.
2. Occupancies or applications requiring precision in indoor temperature control as *approved* by the *code official*.

C403.4.1.3 Setpoint overlap restriction. Where a *zone* has a separate heating and a separate cooling thermostatic control located within the *zone*, a limit switch, mechanical stop or direct digital control system with software programming shall be configured to prevent the heating setpoint from exceeding the cooling setpoint and to maintain a deadband in accordance with Section C403.4.1.2.

C403.4.1.4 Heated or cooled vestibules. The heating system for heated vestibules and air curtains with integral heating shall be provided with controls configured to shut off the source of heating when the outdoor air temperature is greater than 45°F (7°C). Vestibule heating and cooling systems shall be controlled by a thermostat located in the vestibule configured to limit heating to a temperature not greater than 60°F (16°C) and cooling to a temperature not less than 85°F (29°C).

Exception: Control of heating or cooling provided by site-recovered energy or transfer air that would otherwise be exhausted.

C403.4.1.5 Hot water boiler outdoor temperature setback control. Hot water boilers that supply heat to the building through one- or two-pipe heating systems shall have an outdoor setback control that lowers the boiler water temperature based on the outdoor temperature.

C403.4.2 Off-hour controls. Each *zone* shall be provided with thermostatic setback controls that are controlled by either an automatic time clock or programmable control system.

Exceptions:

1. *Zones* that will be operated continuously.
2. *Zones* with a full HVAC load demand not exceeding 6,800 Btu/h (2 kW) and having a manual shutoff switch located with *ready access*.

C403.4.2.1 Thermostatic setback. Thermostatic setback controls shall be configured to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C).

C403.4.2.2 Automatic setback and shutdown. Automatic time clock or programmable controls shall be capable of starting and stopping the system for seven different daily schedules per week and retaining their programming and time setting during a loss of power for not fewer than 10 hours. Additionally, the controls shall have a manual override that allows temporary operation of the system for up to 2 hours; a manually operated timer configured to operate the system for up to 2 hours; or an occupancy sensor.

C403.4.2.3 Automatic start and stop. Automatic start and stop controls shall be provided for each HVAC system. The automatic start controls shall be configured to automatically adjust the daily start time of the HVAC system in order to bring each space to the desired occupied temperature immediately prior to scheduled occupancy. Automatic stop controls shall be provided for each HVAC system with direct digital control of individual *zones*. The automatic stop controls shall be configured to reduce the HVAC system's heating temperature setpoint and increase the cooling temperature setpoint by not less than 2°F (1.11ºC) before scheduled unoccupied periods based on the thermal lag and acceptable drift in space temperature that is within comfort limits.

C403.4.3 Hydronic systems controls. The heating of fluids that have been previously mechanically cooled and the cooling of fluids that have been previously mechani-

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cally heated shall be limited in accordance with Sections C403.4.3.1 through C403.4.3.3. Hydronic heating systems comprised of multiple-packaged boilers and designed to deliver conditioned water or steam into a common distribution system shall include automatic controls configured to sequence operation of the boilers. Hydronic heating systems composed of a single boiler and greater than 500,000 Btu/h (146.5 kW) input design capacity shall include either a multistaged or modulating burner.

C403.4.3.1 Three-pipe system. Hydronic systems that use a common return system for both hot water and chilled water are prohibited.

C403.4.3.2 Two-pipe changeover system. Systems that use a common distribution system to supply both heated and chilled water shall be designed to allow a deadband between changeover from one mode to the other of not less than 15°F (8.3°C) outside air temperatures; be designed to and provided with controls that will allow operation in one mode for not less than 4 hours before changing over to the other mode; and be provided with controls that allow heating and cooling supply temperatures at the changeover point to be not more than 30°F (16.7°C) apart.

C403.4.3.3 Hydronic (water loop) heat pump systems. Hydronic heat pump systems shall comply with Sections C403.4.3.3.1 through C403.4.3.3.3.

C403.4.3.3.1 Temperature deadband. Hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection and heat addition shall have controls that are configured to provide a heat pump water supply temperature deadband of not less than 20°F (11°C) between initiation of heat rejection and heat addition by the central devices.

Exception: Where a system loop temperature optimization controller is installed and can determine the most efficient operating temperature based on real-time conditions of demand and capacity, deadbands of less than 20°F (11°C) shall be permitted.

C403.4.3.3.2 Heat rejection. The following shall apply to hydronic water loop heat pump systems in Climate Zones 3 through 8:

1. Where a closed-circuit cooling tower is used directly in the heat pump loop, either an automatic valve shall be installed to bypass the flow of water around the closed-circuit cooling tower, except for any flow necessary for freeze protection, or low-leakage positive-closure dampers shall be provided.
2. Where an open-circuit cooling tower is used directly in the heat pump loop, an automatic valve shall be installed to bypass all heat pump water flow around the open-circuit cooling tower.
3. Where an open-circuit or closed-circuit cooling tower is used in conjunction with a separate heat exchanger to isolate the open-circuit cooling tower from the heat pump loop, heat loss shall be controlled by shutting down the circulation pump on the cooling tower loop.

Exception: Where it can be demonstrated that a heat pump system will be required to reject heat throughout the year.

C403.4.3.3.3 Two-position valve. Each hydronic heat pump on the hydronic system having a total pump system power exceeding 10 hp (7.5 kW) shall have a two-position automatic valve interlocked to shut off the water flow when the compressor is off.

C403.4.4 Part-load controls. Hydronic systems greater than or equal to 300,000 Btu/h (87.9 kW) in design output capacity supplying heated or chilled water to comfort conditioning systems shall include controls that are configured to do all of the following:

1. Automatically reset the supply-water temperatures in response to varying building heating and cooling demand using coil valve position, zone-return water temperature, building-return water temperature or outside air temperature. The temperature shall be reset by not less than 25 percent of the design supply-to-return water temperature difference.
2. Automatically vary fluid flow for hydronic systems with a combined pump motor capacity of 2 hp (1.5 kW) or larger with three or more control valves or other devices by reducing the system design flow rate by not less than 50 percent or the maximum reduction allowed by the equipment manufacturer for proper operation of equipment by valves that modulate or step open and close, or pumps that modulate or turn on and off as a function of load.
3. Automatically vary pump flow on heating-water systems, chilled-water systems and heat rejection loops serving water-cooled unitary air conditioners as follows:
   3.1. Where pumps operate continuously or operate based on a time schedule, pumps with nominal output motor power of 2 hp or more shall have a variable speed drive.
   3.2. Where pumps have automatic direct digital control configured to operate pumps only when zone heating or cooling is required, a variable speed drive shall be provided for pumps with motors having the same or greater nominal output power indicated in Table C403.4.4 based on the climate zone and system served.
4. Where a variable speed drive is required by Item 3 of this section, pump motor power input shall be not more than 30 percent of design wattage at 50

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percent of the design water flow. Pump flow shall be controlled to maintain one control valve nearly wide open or to satisfy the minimum differential pressure.

Exceptions:

1. Supply-water temperature reset is not required for chilled-water systems supplied by off-site district chilled water or chilled water from ice storage systems.
2. Variable pump flow is not required on dedicated coil circulation pumps where needed for freeze protection.
3. Variable pump flow is not required on dedicated equipment circulation pumps where configured in primary/secondary design to provide the minimum flow requirements of the equipment manufacturer for proper operation of equipment.
4. Variable speed drives are not required on heating water pumps where more than 50 percent of annual heat is generated by an electric boiler.

TABLE C403.4.4
VARIABLE SPEED DRIVE (VSD) REQUIREMENTS FOR DEMAND-CONTROLLED PUMPS

CHILLED WATER AND HEAT REJECTION LOOP PUMPS IN THESE CLIMATE ZONES	HEATING WATER PUMPS IN THESE CLIMATE ZONES	VSD REQUIRED FOR MOTORS WITH RATED OUTPUT OF:
0A, 0B, 1A, 1B, 2B	—	≥ 2 hp
2A, 3B	—	≥ 3 hp
3A, 3C, 4A, 4B	7, 8	≥ 5 hp
4C, 5A, 5B, 5C, 6A, 6B	3C, 5A, 5C, 6A, 6B	≥ 7.5 hp
—	4A, 4C, 5B	≥ 10 hp
7, 8	4B	≥ 15 hp
—	2A, 2B, 3A, 3B	≥ 25 hp
—	0B, 1B	≥ 100 hp
—	0A, 1A	≥ 200 hp

For SI: 1 hp = 0.746 kW.

C403.4.5 Pump isolation. Chilled water plants including more than one chiller shall be capable of and configured to reduce flow automatically through the chiller plant when a chiller is shut down. Chillers piped in series for the purpose of increased temperature differential shall be considered as one chiller.

Boiler systems including more than one boiler shall be capable of and configured to reduce flow automatically through the boiler system when a boiler is shut down.

C403.5 Economizers. Economizers shall comply with Sections C403.5.1 through C403.5.5.

An air or water economizer shall be provided for the following cooling systems:

1. Chilled water systems with a total cooling capacity, less cooling capacity provided with air economizers, as specified in Table C403.5(1).
2. Individual fan systems with cooling capacity greater than or equal to 54,000 Btu/h (15.8 kW) in buildings having other than a *Group R* occupancy,

   The total supply capacity of all fan cooling units not provided with economizers shall not exceed 20 percent of the total supply capacity of all fan cooling units in the building or 300,000 Btu/h (88 kW), whichever is greater.
3. Individual fan systems with cooling capacity greater than or equal to 270,000 Btu/h (79.1 kW) in buildings having a *Group R* occupancy.

   The total supply capacity of all fan cooling units not provided with economizers shall not exceed 20 percent of the total supply capacity of all fan cooling units in the building or 1,500,000 Btu/h (440 kW), whichever is greater.

Exceptions: Economizers are not required for the following systems.

1. Individual fan systems not served by chilled water for buildings located in *Climate Zones* 0A, 0B, 1A and 1B.
2. Where more than 25 percent of the air designed to be supplied by the system is to spaces that are designed to be humidified above 35°F (1.7°C) dew-point temperature to satisfy process needs.
3. Systems expected to operate less than 20 hours per week.
4. Systems serving supermarket areas with open refrigerated casework.
5. Where the cooling efficiency is greater than or equal to the efficiency requirements in Table C403.5(2).
6. Systems that include a heat recovery system in accordance with Section C403.10.5.
7. VRF systems installed with a dedicated outdoor air system.

TABLE C403.5(1)
MINIMUM CHILLED-WATER SYSTEM COOLING CAPACITY FOR DETERMINING ECONOMIZER COOLING REQUIREMENTS

CLIMATE ZONES (COOLING)	TOTAL CHILLED-WATER SYSTEM CAPACITY LESS CAPACITY OF COOLING UNITS WITH AIR ECONOMIZERS	
	Local water-cooled chilled-water systems	Air-cooled chilled-water systems or district chilled-water systems
0A, 1A	Economizer not required	Economizer not required
0B, 1B, 2A, 2B	960,000 Btu/h	1,250,000 Btu/h
3A, 3B, 3C, 4A, 4B, 4C	720,000 Btu/h	940,000 Btu/h
5A, 5B, 5C, 6A, 6B, 7, 8	1,320,000 Btu/h	1,720,000 Btu/h

For SI: 1 British thermal unit per hour = 0.2931 W.

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TABLE C403.5(2)
EQUIPMENT EFFICIENCY PERFORMANCE EXCEPTION FOR ECONOMIZERS

CLIMATE ZONES	COOLING EQUIPMENT PERFORMANCE IMPROVEMENT (EER OR IPLV)
2A, 2B	10% efficiency improvement
3A, 3B	15% efficiency improvement
4A, 4B	20% efficiency improvement

C403.5.1 Integrated economizer control. Economizer systems shall be integrated with the mechanical cooling system and be configured to provide partial cooling even where additional mechanical cooling is required to provide the remainder of the cooling load. Controls shall not be capable of creating a false load in the mechanical cooling systems by limiting or disabling the economizer or any other means, such as hot gas bypass, except at the lowest stage of mechanical cooling.

Units that include an air economizer shall comply with the following:

1. Unit controls shall have the mechanical cooling capacity control interlocked with the air economizer controls such that the outdoor air damper is at the 100-percent open position when mechanical cooling is on and the outdoor air damper does not begin to close to prevent coil freezing due to minimum compressor run time until the leaving air temperature is less than 45°F (7°C).
2. Direct expansion (DX) units that control 75,000 Btu/h (22 kW) or greater of rated capacity of the capacity of the mechanical cooling directly based on occupied space temperature shall have not fewer than two stages of mechanical cooling capacity.
3. Other DX units, including those that control space temperature by modulating the airflow to the space, shall be in accordance with Table C403.5.1.

TABLE C403.5.1
DX COOLING STAGE REQUIREMENTS FOR MODULATING AIRFLOW UNITS

RATING CAPACITY	MINIMUM NUMBER OF MECHANICAL COOLING STAGES	MINIMUM COMPRESSOR DISPLACEMENT[a]
≥ 65,000 Btu/h and < 240,000 Btu/h	3 stages	≤ 35% of full load
≥ 240,000 Btu/h	4 stages	≤ 25% full load

For SI: 1 British thermal unit per hour = 0.2931 W.

a. For mechanical cooling stage control that does not use variable compressor displacement, the percent displacement shall be equivalent to the mechanical cooling capacity reduction evaluated at the full load rating conditions for the compressor.

C403.5.2 Economizer heating system impact. HVAC system design and economizer controls shall be such that economizer operation does not increase building heating energy use during normal operation.

Exception: Economizers on variable air volume (VAV) systems that cause zone level heating to increase because of a reduction in supply air temperature.

C403.5.3 Air economizers. Where economizers are required by Section C403.5, air economizers shall comply with Sections C403.5.3.1 through C403.5.3.5.

C403.5.3.1 Design capacity. Air economizer systems shall be configured to modulate *outdoor air* and return air dampers to provide up to 100 percent of the design supply air quantity as *outdoor air* for cooling.

C403.5.3.2 Control signal. Economizer controls and dampers shall be configured to sequence the dampers with the mechanical cooling equipment and shall not be controlled by only mixed-air temperature.

Exception: The use of mixed-air temperature limit control shall be permitted for systems controlled from space temperature (such as single-*zone* systems).

C403.5.3.3 High-limit shutoff. Air economizers shall be configured to automatically reduce *outdoor air* intake to the design minimum *outdoor air* quantity when *outdoor air* intake will not reduce cooling energy usage. High-limit shutoff control types for specific climates shall be chosen from Table C403.5.3.3. High-limit shutoff control settings for these control types shall be those specified in Table C403.5.3.3.

C403.5.3.4 Relief of excess outdoor air. Systems shall be capable of relieving excess *outdoor air* during air economizer operation to prevent overpressurizing the building. The relief air outlet shall be located to avoid recirculation into the building.

C403.5.3.5 Economizer dampers. Return, exhaust/relief and outdoor air dampers used in economizers shall comply with Section C403.7.7.

C403.5.4 Water-side economizers. Where economizers are required by Section C403.5, water-side economizers shall comply with Sections C403.5.4.1 and C403.5.4.2.

C403.5.4.1 Design capacity. Water economizer systems shall be configured to cool supply air by indirect evaporation and providing up to 100 percent of the expected system cooling load at *outdoor air* temperatures of not greater than 50°F (10°C) dry bulb/45°F (7°C) wet bulb.

Exceptions:

1. Systems primarily serving computer rooms in which 100 percent of the expected system cooling load at 40°F (4°C) dry bulb/35°F (1.7°C) wet bulb is met with evaporative water economizers.
2. Systems primarily serving computer rooms with dry cooler water economizers that satisfy 100 percent of the expected system cooling load at 35°F (1.7°C) dry bulb.
3. Systems where dehumidification requirements cannot be met using outdoor air temperatures of 50°F (10°C) dry bulb/45°F

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TABLE C403.5.3.3
HIGH-LIMIT SHUTOFF CONTROL SETTING FOR AIR ECONOMIZERS[b]

DEVICE TYPE	CLIMATE ZONE	REQUIRED HIGH LIMIT (ECONOMIZER OFF WHEN):	
		Equation	Description
Fixed dry bulb	0B, 1B, 2B, 3B, 3C, 4B, 4C, 5B, 5C, 6B, 7, 8	$T_{OA} > 75°F$	Outdoor air temperature exceeds 75°F
	5A, 6A	$T_{OA} > 70°F$	Outdoor air temperature exceeds 70°F
	0A, 1A, 2A, 3A, 4A	$T_{OA} > 65°F$	Outdoor air temperature exceeds 65°F
Differential dry bulb	0B, 1B, 2B, 3B, 3C, 4B, 4C, 5A, 5B, 5C, 6A, 6B, 7, 8	$T_{OA} > T_{RA}$	Outdoor air temperature exceeds return air temperature
Fixed enthalpy with fixed dry-bulb temperatures	All	$h_{OA} > 28$ Btu/lb[a] or $T_{OA} > 75°F$	Outdoor air enthalpy exceeds 28 Btu/lb of dry air[a] or Outdoor air temperature exceeds 75°F
Differential enthalpy with fixed dry-bulb temperature	All	$h_{OA} > h_{RA}$ or $T_{OA} > 75°F$	Outdoor air enthalpy exceeds return air enthalpy or Outdoor air temperature exceeds 75°F

For SI: °C = (°F – 32)/1.8, 1 Btu/lb = 2.33 kJ/kg.

a. At altitudes substantially different than sea level, the fixed enthalpy limit shall be set to the enthalpy value at 75°F and 50-percent relative humidity. As an example, at approximately 6,000 feet elevation, the fixed enthalpy limit is approximately 30.7 Btu/lb.

b. Devices with selectable setpoints shall be capable of being set to within 2°F and 2 Btu/lb of the setpoint listed.

(7°C) wet bulb and where 100 percent of the expected system cooling load at 45°F (7°C) dry bulb/40°F (4°C) wet bulb is met with evaporative water economizers.

C403.5.4.2 Maximum pressure drop. Precooling coils and water-to-water heat exchangers used as part of a water economizer system shall either have a water-side pressure drop of less than 15 feet (45 kPa) of water or a secondary loop shall be created so that the coil or heat exchanger pressure drop is not seen by the circulating pumps when the system is in the normal cooling (noneconomizer) mode.

C403.5.5 Economizer fault detection and diagnostics. Air-cooled unitary direct-expansion units listed in the tables in Section C403.3.2 and variable refrigerant flow (VRF) units that are equipped with an economizer in accordance with Sections C403.5 through C403.5.4 shall include a fault detection and diagnostics system complying with the following:

1. The following temperature sensors shall be permanently installed to monitor system operation:
   1.1. Outside air.
   1.2. Supply air.
   1.3. Return air.
2. Temperature sensors shall have an accuracy of ±2°F (1.1°C) over the range of 40°F to 80°F (4°C to 26.7°C).
3. Refrigerant pressure sensors, where used, shall have an accuracy of ±3 percent of full scale.
4. The unit controller shall be configured to provide system status by indicating the following:
   4.1. Free cooling available.
   4.2. Economizer enabled.
   4.3. Compressor enabled.
   4.4. Heating enabled.
   4.5. Mixed air low limit cycle active.
   4.6. The current value of each sensor.
5. The unit controller shall be capable of manually initiating each operating mode so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.
6. The unit shall be configured to report faults to a fault management application available for *access* by day-to-day operating or service personnel, or annunciated locally on zone thermostats.
7. The fault detection and diagnostics system shall be configured to detect the following faults:
   7.1. Air temperature sensor failure/fault.
   7.2. Not economizing when the unit should be economizing.
   7.3. Economizing when the unit should not be economizing.
   7.4. Damper not modulating.
   7.5. Excess outdoor air.

C403.6 Requirements for mechanical systems serving multiple zones. Sections C403.6.1 through C403.6.9 shall apply to mechanical systems serving multiple zones.

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C403.6.1 Variable air volume and multiple-zone systems. Supply air systems serving multiple zones shall be variable air volume (VAV) systems that have zone controls configured to reduce the volume of air that is reheated, recooled or mixed in each zone to one of the following:

1. Twenty percent of the zone design peak supply for systems with *direct digital control* (DDC) and 30 percent for other systems.
2. Systems with DDC where all of the following apply:
   2.1. The airflow rate in the deadband between heating and cooling does not exceed 20 percent of the zone design peak supply rate or higher allowed rates under Items 3, 4 and 5 of this section.
   2.2. The first stage of heating modulates the zone supply air temperature setpoint up to a maximum setpoint while the airflow is maintained at the deadband flow rate.
   2.3. The second stage of heating modulates the airflow rate from the deadband flow rate up to the heating maximum flow rate that is less than 50 percent of the zone design peak supply rate.
3. The outdoor airflow rate required to meet the minimum ventilation requirements of Chapter 4 of the *International Mechanical Code.*
4. Any higher rate that can be demonstrated to reduce overall system annual energy use by offsetting reheat/recool energy losses through a reduction in outdoor air intake for the system as approved by the code official.
5. The airflow rate required to comply with applicable codes or accreditation standards such as pressure relationships or minimum air change rates.

Exception: The following individual zones or entire air distribution systems are exempted from the requirement for VAV control:

1. *Zones* or supply air systems where not less than 75 percent of the energy for reheating or for providing warm air in mixing systems is provided from a site-recovered, including condenser heat, or site-solar energy source.
2. Systems that prevent reheating, recooling, mixing or simultaneous supply of air that has been previously cooled, either mechanically or through the use of economizer systems, and air that has been previously mechanically heated.

C403.6.2 Single-duct VAV systems, terminal devices. Single-duct VAV systems shall use terminal devices capable of and configured to reduce the supply of primary supply air before reheating or recooling takes place.

C403.6.3 Dual-duct and mixing VAV systems, terminal devices. Systems that have one warm air duct and one cool air duct shall use terminal devices that are configured to reduce the flow from one duct to a minimum before mixing of air from the other duct takes place.

C403.6.4 Single-fan dual-duct and mixing VAV systems, economizers. Individual dual-duct or mixing heating and cooling systems with a single fan and with total capacities greater than 90,000 Btu/h [(26.4 kW) 7.5 tons] shall not be equipped with air economizers.

C403.6.5 Supply-air temperature reset controls. Multiple-zone HVAC systems shall include controls that are capable of and configured to automatically reset the supply-air temperature in response to representative building loads, or to outdoor air temperature. The controls shall be configured to reset the supply air temperature not less than 25 percent of the difference between the design supply-air temperature and the design room air temperature. Controls that adjust the reset based on zone humidity are allowed in Climate Zones 0B, 1B, 2B, 3B, 3C and 4 through 8. HVAC zones that are expected to experience relatively constant loads shall have maximum airflow designed to accommodate the fully reset supply-air temperature.

Exceptions:

1. Systems that prevent reheating, recooling or mixing of heated and cooled supply air.
2. Seventy-five percent of the energy for reheating is from site-recovered or site-solar energy sources.
3. Systems in Climate Zones 0A, 1A and 3A with less than 3,000 cfm (1500 L/s) of design outside air.
4. Systems in Climate Zone 2A with less than 10,000 cfm (5000 L/s) of design outside air.
5. Systems in Climate Zones 0A, 1A, 2A and 3A with not less than 80 percent outside air and employing exhaust air energy recovery complying with Section C403.7.4.

C403.6.5.1 Dehumidification control interaction. In Climate Zones 0A, 1A, 2A and 3A, the system design shall allow supply-air temperature reset while dehumidification is provided. When dehumidification control is active, air economizers shall be locked out.

C403.6.6 Multiple-zone VAV system ventilation optimization control. Multiple-zone VAV systems with direct digital control of individual zone boxes reporting to a central control panel shall have automatic controls configured to reduce outdoor air intake flow below design rates in response to changes in system *ventilation* efficiency (E_v) as defined by the *International Mechanical Code*.

Exceptions:

1. VAV systems with zonal transfer fans that recirculate air from other zones without directly mixing it with outdoor air, dual-duct dual-fan VAV systems, and VAV systems with fan-powered terminal units.

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2. Systems where total design exhaust airflow is more than 70 percent of total design outdoor air intake flow requirements.

C403.6.7 Parallel-flow fan-powered VAV air terminal control. Parallel-flow fan-powered VAV air terminals shall have automatic controls configured to:

1. Turn off the terminal fan except when space heating is required or where required for ventilation.
2. Turn on the terminal fan as the first stage of heating before the heating coil is activated.
3. During heating for warmup or setback temperature control, either:
   3.1. Operate the terminal fan and heating coil without primary air.
   3.2. Reverse the terminal damper logic and provide heating from the central air handler by primary air.

C403.6.8 Setpoints for direct digital control. For systems with direct digital control of individual zones reporting to the central control panel, the static pressure setpoint shall be reset based on the *zone* requiring the most pressure. In such case, the setpoint is reset lower until one *zone* damper is nearly wide open. The direct digital controls shall be capable of monitoring zone damper positions or shall have an alternative method of indicating the need for static pressure that is configured to provide all of the following:

1. Automatic detection of any *zone* that excessively drives the reset logic.
2. Generation of an alarm to the system operational location.
3. Allowance for an operator to readily remove one or more *zones* from the reset algorithm.

C403.6.9 Static pressure sensor location. Static pressure sensors used to control VAV fans shall be located such that the controller setpoint is not greater than 1.2 inches w.c. (299 Pa). Where this results in one or more sensors being located downstream of major duct splits, not less than one sensor shall be located on each major branch to ensure that static pressure can be maintained in each branch.

C403.7 Ventilation and exhaust systems. In addition to other requirements of Section C403 applicable to the provision of ventilation air or the exhaust of air, ventilation and exhaust systems shall be in accordance with Sections C403.7.1 through C403.7.7.

C403.7.1 Demand control ventilation. Demand control ventilation (DCV) shall be provided for all single-zone systems required to comply with Sections C403.5 through C403.5.3 and spaces larger than 500 square feet (46.5 m^2) and with an average occupant load of 15 people or greater per 1,000 square feet (93 m^2) of floor area, as established in Table 403.3.1.1 of the *International Mechanical Code*, and served by systems with one or more of the following:

1. An air-side economizer.
2. Automatic modulating control of the outdoor air damper.
3. A design outdoor airflow greater than 3,000 cfm (1416 L/s).

Exceptions:

1. Systems with energy recovery complying with Section C403.7.4.2.
2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.
3. Multiple-zone systems with a design outdoor airflow less than 750 cfm (354 L/s).
4. Spaces where more than 75 percent of the space design outdoor airflow is required for makeup air that is exhausted from the space or transfer air that is required for makeup air that is exhausted from other spaces.
5. Spaces with one of the following occupancy classifications as defined in Table 403.3.1.1 of the *International Mechanical Code*: correctional cells, education laboratories, barber, beauty and nail salons, and bowling alley seating areas.

C403.7.2 Enclosed parking garage ventilation controls. Enclosed parking garages used for storing or handling automobiles operating under their own power shall employ carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors and automatic controls configured to stage fans or modulate fan average airflow rates to 50 percent or less of design capacity, or intermittently operate fans less than 20 percent of the occupied time or as required to maintain acceptable contaminant levels in accordance with *International Mechanical Code* provisions. Failure of contamination-sensing devices shall cause the exhaust fans to operate continuously at design airflow.

Exceptions:

1. Garages with a total exhaust capacity less than 8,000 cfm (3,755 L/s) with ventilation systems that do not utilize heating or mechanical cooling.
2. Garages that have a garage area to ventilation system motor nameplate power ratio that exceeds 1,125 cfm/hp (710 L/s/kW) and do not utilize heating or mechanical cooling.

C403.7.3 Ventilation air heating control. Units that provide ventilation air to multiple zones and operate in conjunction with zone heating and cooling systems shall not use heating or heat recovery to warm supply air to a temperature greater than 60°F (16°C) when representative

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building loads or outdoor air temperatures indicate that the majority of zones require cooling.

C403.7.4 Energy recovery systems. Energy recovery ventilation systems shall be provided as specified in either Section C403.7.4.1 or C403.7.4.2, as applicable.

C403.7.4.1 Nontransient dwelling units. Nontransient dwelling units shall be provided with outdoor air energy recovery ventilation systems with an *enthalpy recovery ratio* of not less than 50 percent at cooling design condition and not less than 60 percent at heating design condition.

Exceptions:

1. Nontransient dwelling units in Climate Zone 3C.
2. Nontransient dwelling units with not more than 500 square feet (46 m^2) of *conditioned floor area* in Climate Zones 0, 1, 2, 3, 4C and 5C.
3. *Enthalpy recovery ratio* requirements at heating design condition in Climate Zones 0, 1 and 2.
4. *Enthalpy recovery ratio* requirements at cooling design condition in Climate Zones 4, 5, 6, 7 and 8.

C403.7.4.2 Spaces other than nontransient dwelling units. Where the supply airflow rate of a fan system serving a space other than a nontransient dwelling unit exceeds the values specified in Tables C403.7.4.2(1) and C403.7.4.2(2), the system shall include an energy recovery system. The energy recovery system shall provide an *enthalpy recovery ratio* of not less than 50 percent at design conditions. Where an air economizer is required, the energy recovery system shall include a bypass or controls that permit operation of the economizer as required by Section C403.5.

Exception: An energy recovery ventilation system shall not be required in any of the following conditions:

1. Where energy recovery systems are prohibited by the *International Mechanical Code*.
2. Laboratory fume hood systems that include not fewer than one of the following features:
   2.1. Variable-air-volume hood exhaust and room supply systems configured to reduce exhaust and makeup air volume to 50 percent or less of design values.
   2.2. Direct makeup (auxiliary) air supply equal to or greater than 75 percent of the exhaust rate, heated not warmer than 2°F (1.1°C) above room setpoint, cooled to not cooler than 3°F (1.7°C) below room setpoint, with no humidification added, and no simultaneous heating and cooling used for dehumidification control.
3. Systems serving spaces that are heated to less than 60°F (15.5°C) and that are not cooled.
4. Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site-solar energy.
5. *Enthalpy recovery ratio* requirements at heating design condition in *Climate Zones* 1 and 2.
6. *Enthalpy recovery ratio* requirements at cooling design condition in *Climate Zones* 0, 3C, 4C, 5B, 5C, 6B, 7 and 8.
7. Systems requiring dehumidification that employ energy recovery in series with the cooling coil.
8. Where the largest source of air exhausted at a single location at the building exterior is less than 75 percent of the design *outdoor air* flow rate.
9. Systems expected to operate less than 20 hours per week at the *outdoor air* percentage covered by Table C403.7.4.2(1).
10. Systems exhausting toxic, flammable, paint or corrosive fumes or dust.
11. Commercial kitchen hoods used for collecting and removing grease vapors and smoke.

C403.7.5 Kitchen exhaust systems. Replacement air introduced directly into the exhaust hood cavity shall not be greater than 10 percent of the hood exhaust airflow rate. Conditioned supply air delivered to any space shall not exceed the greater of the following:

1. The ventilation rate required to meet the space heating or cooling load.
2. The hood exhaust flow minus the available transfer air from adjacent space where available transfer air is considered to be that portion of outdoor ventilation air not required to satisfy other exhaust needs, such as restrooms, and not required to maintain pressurization of adjacent spaces.

Where total kitchen hood exhaust airflow rate is greater than 5,000 cfm (2360 L/s), each hood shall be a factory-built commercial exhaust hood listed by a nationally recognized testing laboratory in compliance with UL 710. Each hood shall have a maximum exhaust rate as specified in Table C403.7.5 and shall comply with one of the following:

1. Not less than 50 percent of all replacement air shall be transfer air that would otherwise be exhausted.
2. Demand ventilation systems on not less than 75 percent of the exhaust air that are configured to provide not less than a 50-percent reduction in

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exhaust and replacement air system airflow rates, including controls necessary to modulate airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and idle.

3. Listed energy recovery devices with a sensible heat recovery effectiveness of not less than 40 percent on not less than 50 percent of the total exhaust airflow.

Where a single hood, or hood section, is installed over appliances with different duty ratings, the maximum allowable flow rate for the hood or hood section shall be based on the requirements for the highest appliance duty rating under the hood or hood section.

Exception: Where not less than 75 percent of all the replacement air is transfer air that would otherwise be exhausted.

TABLE C403.7.4.2(1)
ENERGY RECOVERY REQUIREMENT (Ventilation systems operating less than 8,000 hours per year)

CLIMATE ZONE	PERCENT (%) OUTDOOR AIR AT FULL DESIGN AIRFLOW RATE							
	≥ 10% and < 20%	≥ 20% and < 30%	≥ 30% and < 40%	≥ 40% and < 50%	≥ 50% and < 60%	≥ 60% and < 70%	≥ 70% and < 80%	≥ 80%
	Design Supply Fan Airflow Rate (cfm)							
3B, 3C, 4B, 4C, 5B	NR	NR	NR	NR	NR	NR	NR	NR
0B, 1B, 2B, 5C	NR	NR	NR	NR	≥ 26,000	≥ 12,000	≥ 5,000	≥ 4,000
6B	≥ 28,000	≥ 26,5000	≥ 11,000	≥ 5,500	≥ 4,500	≥ 3,500	≥ 2,500	≥ 1,500
0A, 1A, 2A, 3A, 4A, 5A, 6A	≥ 26,000	≥ 16,000	≥ 5,500	≥ 4,500	≥ 3,500	≥ 2,000	≥ 1,000	> 120
7, 8	≥ 4,500	≥ 4,000	≥ 2,500	≥ 1,000	> 140	> 120	> 100	> 80

For SI: 1 cfm = 0.4719 L/s.
NR = Not Required.

TABLE C403.7.4.2(2)
ENERGY RECOVERY REQUIREMENT (Ventilation systems operating not less than 8,000 hours per year)

CLIMATE ZONE	PERCENT (%) OUTDOOR AIR AT FULL DESIGN AIRFLOW RATE							
	≥ 10% and < 20%	≥ 20% and < 30%	≥ 30% and < 40%	≥ 40% and < 50%	≥ 50% and < 60%	≥ 60% and < 70%	≥ 70% and < 80%	≥ 80%
	Design Supply Fan Airflow Rate (cfm)							
3C	NR	NR	NR	NR	NR	NR	NR	NR
0B, 1B, 2B, 3B, 4C, 5C	NR	≥ 19,500	≥ 9,000	≥ 5,000	≥ 4,000	≥ 3,000	≥ 1,500	≥ 120
0A, 1A, 2A, 3A, 4B, 5B	≥ 2,500	≥ 2,000	≥ 1,000	≥ 500	≥ 140	≥ 120	≥ 100	≥ 80
4A, 5A, 6A, 6B, 7, 8	≥ 200	≥ 130	≥ 100	≥ 80	≥ 70	≥ 60	≥ 50	≥ 40

For SI: 1 cfm = 0.4719 L/s.
NR = Not Required.

TABLE C403.7.5
MAXIMUM NET EXHAUST FLOW RATE, CFM PER LINEAR FOOT OF HOOD LENGTH

TYPE OF HOOD	LIGHT-DUTY EQUIPMENT	MEDIUM-DUTY EQUIPMENT	HEAVY-DUTY EQUIPMENT	EXTRA-HEAVY-DUTY EQUIPMENT
Wall-mounted canopy	140	210	280	385
Single island	280	350	420	490
Double island (per side)	175	210	280	385
Eyebrow	175	175	NA	NA
Backshelf/Pass-over	210	210	280	NA

For SI: 1 cfm = 0.4719 L/s; 1 foot = 304.8 mm.
NA = Not Allowed.

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C403.7.6 Automatic control of HVAC systems serving guestrooms. In Group R-1 buildings containing more than 50 guestrooms, each guestroom shall be provided with controls complying with the provisions of Sections C403.7.6.1 and C403.7.6.2. Card key controls comply with these requirements.

C403.7.6.1 Temperature setpoint controls. Controls shall be provided on each HVAC system that are capable of and configured with three modes of temperature control.

1. When the guestroom is rented but unoccupied, the controls shall automatically raise the cooling setpoint and lower the heating setpoint by not less than 4°F (2°C) from the occupant setpoint within 30 minutes after the occupants have left the guestroom.
2. When the guestroom is unrented and unoccupied, the controls shall automatically raise the cooling setpoint to not lower than 80°F (27°C) and lower the heating setpoint to not higher than 60°F (16°C). Unrented and unoccupied guestroom mode shall be initiated within 16 hours of the guestroom being continuously occupied or where a *networked guestroom control system* indicates that the guestroom is unrented and the guestroom is unoccupied for more than 20 minutes. A *networked guestroom control system* that is capable of returning the thermostat setpoints to default occupied setpoints 60 minutes prior to the time a guestroom is scheduled to be occupied is not precluded by this section. Cooling that is capable of limiting relative humidity with a setpoint not lower than 65-percent relative humidity during unoccupied periods is not precluded by this section.
3. When the guestroom is occupied, HVAC setpoints shall return to their occupied setpoints once occupancy is sensed.

C403.7.6.2 Ventilation controls. Controls shall be provided on each HVAC system that are capable of and configured to automatically turn off the ventilation and exhaust fans within 20 minutes of the occupants leaving the guestroom, or *isolation devices* shall be provided to each guestroom that are capable of automatically shutting off the supply of outdoor air to and exhaust air from the guestroom.

Exception: Guestroom ventilation systems are not precluded from having an automatic daily pre-occupancy purge cycle that provides daily outdoor air ventilation during unrented periods at the design ventilation rate for 60 minutes, or at a rate and duration equivalent to one air change.

C403.7.7 Shutoff dampers. Outdoor air intake and exhaust openings and stairway and shaft vents shall be provided with Class I motorized dampers. The dampers shall have an air leakage rate not greater than 4 cfm/ft^2 (20.3 L/s × m^2) of damper surface area at 1.0 inch water gauge (249 Pa) and shall be labeled by an *approved agency* when tested in accordance with AMCA 500D for such purpose.

Outdoor air intake and exhaust dampers shall be installed with automatic controls configured to close when the systems or spaces served are not in use or during unoccupied period warm-up and setback operation, unless the systems served require outdoor or exhaust air in accordance with the *International Mechanical Code* or the dampers are opened to provide intentional economizer cooling.

Stairway and shaft vent dampers shall be installed with automatic controls configured to open upon the activation of any fire alarm initiating device of the building's fire alarm system or the interruption of power to the damper.

Exception: Nonmotorized gravity dampers shall be an alternative to motorized dampers for exhaust and relief openings as follows:

1. In buildings less than three stories in height above grade plane.
2. In buildings of any height located in *Climate Zones* 0, 1, 2 or 3.
3. Where the design exhaust capacity is not greater than 300 cfm (142 L/s).

Nonmotorized gravity dampers shall have an air leakage rate not greater than 20 cfm/ft^2 (101.6 L/s × m^2) where not less than 24 inches (610 mm) in either dimension and 40 cfm/ft^2 (203.2 L/s × m^2) where less than 24 inches (610 mm) in either dimension. The rate of air leakage shall be determined at 1.0 inch water gauge (249 Pa) when tested in accordance with AMCA 500D for such purpose. The dampers shall be labeled by an *approved agency*.

C403.8 Fans and fan controls. Fans in HVAC systems shall comply with Sections C403.8.1 through C403.8.6.1.

C403.8.1 Allowable fan horsepower. Each HVAC system having a total fan system motor nameplate horsepower exceeding 5 hp (3.7 kW) at fan system design conditions shall not exceed the allowable *fan system motor nameplate hp* (Option 1) or *fan system bhp* (Option 2) shown in Table C403.8.1(1). This includes supply fans, exhaust fans, return/relief fans, and fan-powered terminal units associated with systems providing heating or cooling capability. Single-zone variable air volume systems shall comply with the constant volume fan power limitation.

Exceptions:

1. Hospital, vivarium and laboratory systems that utilize flow control devices on exhaust or return to maintain space pressure relationships necessary for occupant health and safety or environmental control shall be permitted to use variable volume fan power limitation.
2. Individual exhaust fans with motor nameplate horsepower of 1 hp (0.746 kW) or less are

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exempt from the allowable fan horsepower requirement.

C403.8.2 Motor nameplate horsepower. For each fan, the fan brake horsepower (bhp) shall be indicated on the construction documents and the selected motor shall be not larger than the first available motor size greater than the following:

1. For fans less than 6 bhp (4476 W), 1.5 times the fan brake horsepower.
2. For fans 6 bhp (4476 W) and larger, 1.3 times the fan brake horsepower.

Exceptions:

1. Fans equipped with electronic speed control devices to vary the fan airflow as a function of load.
2. Fans with a fan nameplate electrical input power of less than 0.89 kW.

TABLE C403.8.1(1)
FAN POWER LIMITATION

	LIMIT	CONSTANT VOLUME	VARIABLE VOLUME
Option 1: Fan system motor nameplate hp	Allowable nameplate motor hp	$hp \le CFM_S \times 0.0011$	$hp \le CFM_S \times 0.0015$
Option 2: Fan system bhp	Allowable fan system bhp	$bhp \le CFM_S \times 0.00094 + A$	$bhp \le CFM_S \times 0.0013 + A$

For SI: 1 bhp = 735.5 W, 1 hp = 745.5 W, 1 cfm = 0.4719 L/s.
where:
CFM_S = The maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute.
hp = The maximum combined motor nameplate horsepower.
bhp = The maximum combined fan brake horsepower.
A = Sum of $[PD \times CFM_D / 4131]$.
where:
PD = Each applicable pressure drop adjustment from Table C403.8.1(2) in. w.c.
CFM_D = The design airflow through each applicable device from Table C403.8.1(2) in cubic feet per minute.

TABLE C403.8.1(2)
FAN POWER LIMITATION PRESSURE DROP ADJUSTMENT

DEVICE	ADJUSTMENT
Credits	
Return air or exhaust systems required by code or accreditation standards to be fully ducted, or systems required to maintain air pressure differentials between adjacent rooms	0.5 inch w.c. (2.15 inches w.c. for laboratory and vivarium systems)
Return and exhaust airflow control devices	0.5 inch w.c.
Exhaust filters, scrubbers or other exhaust treatment	The pressure drop of device calculated at fan system design condition
Particulate filtration credit: MERV 9 thru 12	0.5 inch w.c.
Particulate filtration credit: MERV 13 thru 15	0.9 inch w.c.
Particulate filtration credit: MERV 16 and greater and electronically enhanced filters	Pressure drop calculated at 2 times the clean filter pressure drop at fan system design condition.
Carbon and other gas-phase air cleaners	Clean filter pressure drop at fan system design condition.
Biosafety cabinet	Pressure drop of device at fan system design condition.
Energy recovery device, other than coil runaround loop	For each airstream, (2.2 × energy recovery effectiveness - 0.5) inch w.c.
Coil runaround loop	0.6 inch w.c. for each airstream.
Evaporative humidifier/cooler in series with another cooling coil	Pressure drop of device at fan system design conditions.
Sound attenuation section (fans serving spaces with design background noise goals below NC35)	0.15 inch w.c.
Exhaust system serving fume hoods	0.35 inch w.c.
Laboratory and vivarium exhaust systems in high-rise buildings	0.25 inch w.c./100 feet of vertical duct exceeding 75 feet.
Deductions	
Systems without central cooling device	- 0.6 inch w.c.
Systems without central heating device	- 0.3 inch w.c.
Systems with central electric resistance heat	- 0.2 inch w.c.

For SI: 1 inch w.c. = 249 Pa, 1 inch = 25.4 mm, 1 foot = 304.8 mm.
w.c. = Water Column, NC = Noise Criterion.

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3. Systems complying with Section C403.8.1 fan system motor nameplate hp (Option 1).
4. Fans with motor nameplate horsepower less than 1 hp (746 W).

C403.8.3 Fan efficiency. Each fan and fan array shall have a fan energy index (FEI) of not less than 1.00 at the design point of operation, as determined in accordance with AMCA 208 by an *approved* independent testing laboratory and labeled by the manufacturer. Each fan and fan array used for a variable-air-volume system shall have an FEI of not less than 0.95 at the design point of operation, as determined in accordance with AMCA 208 by an approved independent testing laboratory and labeled by the manufacturer. The FEI for fan arrays shall be calculated in accordance with AMCA 208 Annex C.

Exceptions: The following fans are not required to have a fan energy index:

1. Fans that are not embedded fans with motor nameplate horsepower of less than 1.0 hp (0.75 kW) or with a nameplate electrical input power of less than 0.89 kW.
2. Embedded fans that have a motor nameplate horsepower of 5 hp (3.7 kW) or less, or with a fan system electrical input power of 4.1 kW or less.
3. Multiple fans operated in series or parallel as the functional equivalent of a single fan that have a combined motor nameplate horsepower of 5 hp (3.7 kW) or less or with a fan system electrical input power of 4.1 kW or less.
4. Fans that are part of equipment covered in Section C403.3.2.
5. Fans included in an equipment package certified by an *approved agency* for air or energy performance.
6. Ceiling fans, which are defined as nonportable devices suspended from a ceiling or overhead structure for circulating air via the rotation of the blades.
7. Fans used for moving gases at temperatures above 482°F (250°C).
8. Fans used for operation in explosive atmospheres.
9. Reversible fans used for tunnel ventilation.
10. Fans that are intended to operate only during emergency conditions.
11. Fans outside the scope of AMCA 208.

C403.8.4 Fractional hp fan motors. Motors for fans that are not less than $^{1}/_{12}$ hp (0.062 kW) and less than 1 hp (0.746 kW) shall be electronically commutated motors or shall have a minimum motor efficiency of 70 percent, rated in accordance with DOE 10 CFR 431. These motors shall have the means to adjust motor speed for either balancing or remote control. The use of belt-driven fans to sheave adjustments for airflow balancing instead of a varying motor speed shall be permitted.

Exceptions: The following motors are not required to comply with this section

1. Motors in the airstream within fan coils and terminal units that only provide heating to the space served.
2. Motors in space-conditioning equipment that comply with Section C403.3.2 or Sections C403.8.1. through C403.8.3.
3. Motors that comply with Section C405.8.

C403.8.5 Low-capacity ventilation fans. Mechanical ventilation system fans with motors less than $^{1}/_{12}$ hp (0.062 kW) in capacity shall meet the efficacy requirements of Table C403.8.5 at one or more rating points.

Exceptions:

1. Where ventilation fans are a component of a listed heating or cooling appliance.
2. Dryer exhaust duct power ventilators, domestic range hoods and domestic range booster fans that operate intermittently.

TABLE C403.8.5
LOW-CAPACITY VENTILATION FAN EFFICACY[a]

FAN LOCATION	AIRFLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIRFLOW RATE MAXIMUM (CFM)
HRV or ERV	Any	1.2 cfm/watt	Any
In-line fan	Any	3.8 cfm/watt	Any
Bathroom, utility room	10	2.8 cfm/watt	< 90
Bathroom, utility room	90	3.5 cfm/watt	Any

For SI: 1 cfm/ft = 47.82 W.

a. Airflow shall be tested in accordance with HVI 916 and listed. Efficacy shall be listed or shall be derived from listed power and airflow. Fan efficacy for fully ducted HRV, ERV, balanced and in-line fans shall be determined at a static pressure not less than 0.2 inch w.c. Fan efficacy for ducted range hoods, bathroom and utility room fans shall be determined at a static pressure not less than 0.1 inch w.c.

C403.8.6 Fan control. Controls shall be provided for fans in accordance with Section C403.8.6.1 and as required for specific systems provided in Section C403.

C403.8.6.1 Fan airflow control. Each cooling system listed in Table C403.8.6.1 shall be designed to vary the indoor fan airflow as a function of load and shall comply with the following requirements:

1. Direct expansion (DX) and chilled water cooling units that control the capacity of the mechanical cooling directly based on space temperature shall have not fewer than two stages of fan control. Low or minimum speed shall not be greater than 66 percent of full speed. At low or minimum speed, the fan system shall draw not more than 40 percent of

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the fan power at full fan speed. Low or minimum speed shall be used during periods of low cooling load and ventilation-only operation.

2. Other units including DX cooling units and chilled water units that control the space temperature by modulating the airflow to the space shall have modulating fan control. Minimum speed shall be not greater than 50 percent of full speed. At minimum speed the fan system shall draw not more than 30 percent of the power at full fan speed. Low or minimum speed shall be used during periods of low cooling load and ventilation-only operation.
3. Units that include an air-side economizer in accordance with Section C403.5 shall have not fewer than two speeds of fan control during economizer operation.

Exceptions:

1. Modulating fan control is not required for chilled water and evaporative cooling units with fan motors of less than 1 hp (0.746 kW) where the units are not used to provide *ventilation air* and the indoor fan cycles with the load.
2. Where the volume of outdoor air required to comply with the ventilation requirements of the *International Mechanical Code* at low speed exceeds the air that would be delivered at the speed defined in Section C403.8.6, the minimum speed shall be selected to provide the required *ventilation air*.

TABLE C403.8.6.1
COOLING SYSTEMS

COOLING SYSTEM TYPE	FAN MOTOR SIZE	MECHANICAL COOLING CAPACITY
DX cooling	Any	≥ 65,000 Btu/h
Chilled water and evaporative cooling	≥ 1/4 hp	Any

For SI: 1 British thermal unit per hour = 0.2931 W; 1 hp = 0.746 kW.

C403.9 Large-diameter ceiling fans. Where provided, *large-diameter ceiling fans* shall be tested and labeled in accordance with AMCA 230.

C403.10 Heat rejection equipment. Heat rejection equipment, including air-cooled condensers, dry coolers, open-circuit cooling towers, closed-circuit cooling towers and evaporative condensers, shall comply with this section.

Exception: Heat rejection devices where energy usage is included in the equipment efficiency ratings listed in Tables C403.3.2(6) and C403.3.2(7).

C403.10.1 Fan speed control. Each fan system powered by an individual motor or array of motors with connected power, including the motor service factor, totaling 5 hp (3.7 kW) or more shall have controls and devices configured to automatically modulate the fan speed to control the leaving fluid temperature or condensing temperature and pressure of the heat rejection device. Fan motor power input shall be not more than 30 percent of design wattage at 50 percent of the design airflow.

Exceptions:

1. Fans serving multiple refrigerant or fluid cooling circuits.
2. Condenser fans serving flooded condensers.

C403.10.2 Multiple-cell heat rejection equipment. Multiple-cell heat rejection equipment with variable speed fan drives shall be controlled to operate the maximum number of fans allowed that comply with the manufacturer's requirements for all system components and so that all fans operate at the same fan speed required for the instantaneous cooling duty, as opposed to staged on and off operation. The minimum fan speed shall be the minimum allowable speed of the fan drive system in accordance with the manufacturer's recommendations.

C403.10.3 Limitation on centrifugal fan open-circuit cooling towers. Centrifugal fan open-circuit cooling towers with a combined rated capacity of 1,100 gpm (4164 L/m) or greater at 95°F (35°C) condenser water return, 85°F (29°C) condenser water supply, and 75°F (24°C) outdoor air wet-bulb temperature shall meet the energy efficiency requirement for axial fan open-circuit cooling towers listed in Table C403.3.2(8).

Exception: Centrifugal open-circuit cooling towers that are designed with inlet or discharge ducts or require external sound attenuation.

C403.10.4 Tower flow turndown. Open-circuit cooling towers used on water-cooled chiller systems that are configured with multiple- or variable-speed condenser water pumps shall be designed so that all open-circuit cooling tower cells can be run in parallel with the larger of the flow that is produced by the smallest pump at its minimum expected flow rate or at 50 percent of the design flow for the cell.

C403.10.5 Heat recovery for service water heating. Condenser heat recovery shall be installed for heating or reheating of service hot water provided that the facility operates 24 hours a day, the total installed heat capacity of water-cooled systems exceeds 6,000,000 Btu/hr (1758 kW) of heat rejection, and the design service water heating load exceeds 1,000,000 Btu/h (293 kW).

The required heat recovery system shall have the capacity to provide the smaller of the following:

1. Sixty percent of the peak heat rejection load at design conditions.
2. The preheating required to raise the peak service hot water draw to 85°F (29°C).

Exceptions:

1. Facilities that employ condenser heat recovery for space heating or reheat purposes with a heat recovery design exceeding 30 percent of the peak water-cooled condenser load at design conditions.

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2. Facilities that provide 60 percent of their service water heating from site solar or site recovered energy or from other sources.

C403.10.6 Heat recovery for space conditioning in healthcare facilities. Where heating water is used for space heating, a condenser heat recovery system shall be installed provided that all of the following are true:

1. The building is a Group I-2, Condition 2 occupancy.
2. The total design chilled water capacity for the Group I-2,Condition 2 occupancy, either air cooled or water cooled, required at cooling design conditions exceeds 3,600,000 Btu/h (1100 kw) of cooling.
3. Simultaneous heating and cooling occurs above 60°F (16°C) outdoor air temperature.

The required heat recovery system shall have a cooling capacity that is not less than 7 percent of the total design chilled water capacity of the Group I-2, Condition 2 occupancy at peak design conditions.

Exceptions:

1. Buildings that provide 60 percent or more of their reheat energy from on-site renewable energy or site-recovered energy.
2. Buildings in Climate Zones 5C, 6B, 7 and 8.

C403.11 Refrigeration equipment performance. Refrigeration equipment performance shall be determined in accordance with Sections C403.11.1 and C403.11.2 for commercial refrigerators, freezers, refrigerator-freezers, walk-in coolers, walk-in freezers and refrigeration equipment. The energy use shall be verified through certification under an *approved* certification program or, where a certification program does not exist, the energy use shall be supported by data furnished by the equipment manufacturer.

Exception: Walk-in coolers and walk-in freezers regulated under federal law in accordance with Subpart R of DOE 10 CFR 431.

C403.11.1 Commercial refrigerators, refrigerator-freezers and refrigeration. Refrigeration equipment, defined in DOE 10 CFR Part 431.62, shall have an energy use in kWh/day not greater than the values of Table C403.11.1 when tested and rated in accordance with AHRI Standard 1200.

C403.11.2 Walk-in coolers and walk-in freezers. Walk-in cooler and walk-in freezer refrigeration systems, except for walk-in process cooling refrigeration systems as defined in DOE 10 CFR 431.302, shall meet the requirements of Tables C403.11.2.1(1), C403.11.2.1(2) and C403.11.2.1(3).

C403.11.2.1 Performance standards. *Walk-in coolers* and *walk-in freezers* shall meet the requirements of Tables C403.11.2.1(1), C403.11.2.1(2) and C403.11.2.1(3).

TABLE C403.11.2.1(1)
WALK-IN COOLER AND FREEZER DISPLAY DOOR EFFICIENCY REQUIREMENTS[a]

CLASS DESCRIPTOR	CLASS	MAXIMUM ENERGY CONSUMPTION (kWh/day)[a]
Display door, medium temperature	DD, M	$0.04 \times A_{dd} + 0.41$
Display door, low temperature	DD, L	$0.15 \times A_{dd} + 0.29$

a. A_{dd} is the surface area of the display door.

TABLE C403.11.2.1(2)
WALK-IN COOLER AND FREEZER NONDISPLAY DOOR EFFICIENCY REQUIREMENTS[a]

CLASS DESCRIPTOR	CLASS	MAXIMUM ENERGY CONSUMPTION (kWh/day)[a]
Passage door, medium temperature	PD, M	$0.05 \times A_{nd} + 1.7$
Passage door, low temperature	PD, L	$0.14 \times A_{nd} + 4.8$
Freight door, medium temperature	FD, M	$0.04 \times A_{nd} + 1.9$
Freight door, low temperature	FD, L	$0.12 \times A_{nd} + 5.6$

a. A_{nd} is the surface area of the nondisplay door.

C403.11.3 Refrigeration systems. Refrigerated display cases, *walk-in coolers* or *walk-in freezers* that are served by remote compressors and remote condensers not located in a condensing unit, shall comply with Sections C403.11.3.1 and C403.11.3.2.

Exception: Systems where the working fluid in the refrigeration cycle goes through both subcritical and super-critical states (transcritical) or that use ammonia refrigerant are exempt.

C403.11.3.1 Condensers serving refrigeration systems. Fan-powered condensers shall comply with the following:

1. The design *saturated condensing temperatures* for air-cooled condensers shall not exceed the design dry-bulb temperature plus 10°F (5.6°C) for low-*temperature refrigeration systems*, and the design dry-bulb temperature plus 15°F (8°C) for *medium temperature refrigeration systems* where the *saturated condensing temperature* for blend refrigerants shall be determined using the average of liquid and vapor temperatures as converted from the condenser drain pressure.
2. Condenser fan motors that are less than 1 hp (0.75 kW) shall use electronically commutated motors, permanent split-capacitor-type motors or 3-phase motors.
3. Condenser fans for air-cooled condensers, evaporatively cooled condensers, air- or water-cooled fluid coolers or cooling towers shall

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reduce fan motor demand to not more than 30 percent of design wattage at 50 percent of design air volume, and incorporate one of the following continuous variable speed fan control approaches:

3.1. Refrigeration system condenser control for air-cooled condensers shall use variable setpoint control logic to reset the condensing temperature setpoint in response to ambient dry-bulb temperature.

3.2. Refrigeration system condenser control for evaporatively cooled condensers shall use variable setpoint control logic to reset the condensing temperature setpoint in response to ambient wet-bulb temperature.

4. Multiple fan condensers shall be controlled in unison.

5. The minimum condensing temperature setpoint shall be not greater than 70°F (21°C).

C403.11.3.2 Compressor systems. Refrigeration compressor systems shall comply with the following:

1. Compressors and multiple-compressor system suction groups shall include control systems that use floating suction pressure control logic to reset the target suction pressure temperature based on the temperature requirements of the attached refrigeration display cases or walk-ins.

   Exception: Controls are not required for the following:

   1. Single-compressor systems that do not have variable capacity capability.

   2. Suction groups that have a design saturated suction temperature of 30°F (-1.1°C) or higher, suction groups that comprise the high stage of a two-stage or cascade system, or suction groups that primarily serve chillers for secondary cooling fluids.

2. Liquid subcooling shall be provided for all low-temperature compressor systems with a design cooling capacity equal to or greater than 100,000 Btu (29.3 kW) with a design-saturated suction temperature of -10°F (-23°C) or lower. The sub-cooled liquid temperature shall be controlled at a maximum temperature setpoint of 50°F (10°C) at the exit of the subcooler using either compressor economizer (inter-stage) ports or a separate compressor suction group operating at a saturated suction temperature of 18°F (-7.8°C) or higher.

   2.1. Insulation for liquid lines with a fluid operating temperature less than 60°F (15.6°C) shall comply with Table C403.11.3.

3. Compressors that incorporate internal or external crankcase heaters shall provide a means to cycle the heaters off during compressor operation.

C403.12 Construction of HVAC system elements. Ducts, plenums, piping and other elements that are part of an HVAC system shall be constructed and insulated in accordance with Sections C403.12.1 through C403.12.3.1.

TABLE C403.11.2.1(3)
WALK-IN COOLER AND FREEZER REFRIGERATION SYSTEM EFFICIENCY REQUIREMENTS

CLASS DESCRIPTOR	CLASS	MINIMUM ANNUAL WALK-IN ENERGY FACTOR AWEF (Btu/W-h)[a]	TEST PROCEDURE
Dedicated condensing, medium temperature, indoor system	DC.M.I	5.61	AHRI 1250
Dedicated condensing, medium temperature, outdoor system	DC.M.O	7.60	
Dedicated condensing, low temperature, indoor system, net capacity (q_{net}) < 6,500 Btu/h	DC.L.I, < 6,500	$9.091 \times 10^{-5} \times q_{net} + 1.81$	
Dedicated condensing, low temperature, indoor system, net capacity (q_{net}) ≥ 6,500 Btu/h	DC.L.I, ≥ 6,500	2.40	
Dedicated condensing, low temperature, outdoor system, net capacity (q_{net}) < 6,500 Btu/h	DC.L.O, < 6,500	$6.522 \times 10^{-5} \times q_{net} + 2.73$	
Dedicated condensing, low temperature, outdoor system, net capacity (q_{net}) ≥ 6,500 Btu/h	DC.L.O, ≥ 6,500	3.15	
Unit cooler, medium	UC.M	9.00	
Unit cooler, low temperature, net capacity (q_{net}) < 15,500 Btu/h	UC.L, < 15,500	$1.575 \times 10^{-5} \times q_{net} + 3.91$	
Unit cooler, low temperature, net capacity (q_{net}) ≥ 15,500 Btu/h	UC.L, ≥ 15,500	4.15	

For SI: 1 British thermal unit per hour = 0.2931 W.

a. q_{net} is net capacity (Btu/h) as determined in accordance with AHRI 1250.

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TABLE C403.11.1
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL REFRIGERATORS AND FREEZERS AND REFRIGERATION

EQUIPMENT CATEGORY	CONDENSING UNIT CONFIGURATION	EQUIPMENT FAMILY	RATING TEMP., °F	OPERATING TEMP., °F	EQUIPMENT CLASSIFICATION[a, c]	MAXIMUM DAILY ENERGY CONSUMPTION, kWh/day[d, e]	TEST STANDARD
Remote condensing commercial refrigerators and commercial freezers	Remote (RC)	Vertical open (VOP)	38 (M)	≥ 32	VOP.RC.M	0.64 × TDA + 4.07	AHRI 1200
			0 (L)	< 32	VOP.RC.L	2.20 × TDA + 6.85	
		Semivertical open (SVO)	38 (M)	≥ 32	SVO.RC.M	0.66 × TDA + 3.18	
			0 (L)	< 32	SVO.RC.L	2.20 × TDA + 6.85	
		Horizontal open (HZO)	38 (M)	≥ 32	HZO.RC.M	0.35 × TDA + 2.88	
			0 (L)	< 32	HZO.RC.L	0.55 × TDA + 6.88	
		Vertical closed transparent (VCT)	38 (M)	≥ 32	VCT.RC.M	0.15 × TDA + 1.95	
			0 (L)	< 32	VCT.RC.L	0.49 × TDA + 2.61	
		Horizontal closed transparent (HCT)	38 (M)	≥ 32	HCT.RC.M	0.16 × TDA + 0.13	
			0 (L)	< 32	HCT.RC.L	0.34 × TDA + 0.26	
		Vertical closed solid (VCS)	38 (M)	≥ 32	VCS.RC.M	0.10 × V + 0.26	
			0 (L)	< 32	VCS.RC.L	0.21 × V + 0.54	
		Horizontal closed solid (HCS)	38 (M)	≥ 32	HCS.RC.M	0.10 × V + 0.26	
			0 (L)	< 32	HCS.RC.L	0.21 × V + 0.54	
		Service over counter (SOC)	38 (M)	≥ 32	SOC.RC.M	0.44 × TDA + 0.11	
			0 (L)	< 32	SOC.RC.L	0.93 × TDA + 0.22	
Self-contained commercial refrigerators and commercial freezers with and without doors	Self-contained (SC)	Vertical open (VOP)	38 (M)	≥ 32	VOP.SC.M	1.69 × TDA + 4.71	AHRI 1200
			0 (L)	< 32	VOP.SC.L	4.25 × TDA + 11.82	
		Semivertical open (SVO)	38 (M)	≥ 32	SVO.SC.M	1.70 × TDA + 4.59	
			0 (L)	< 32	SVO.SC.L	4.26 × TDA + 11.51	
		Horizontal open (HZO)	38 (M)	≥ 32	HZO.SC.M	0.72 × TDA + 5.55	
			0 (L)	< 32	HZO.RC.L	1.90 × TDA + 7.08	
		Vertical closed transparent (VCT)	38 (M)	≥ 32	VCT.SC.M	0.10 × V + 0.86	
			0 (L)	< 32	VCT.SC.L	0.29 × V + 2.95	
		Vertical closed solid (VCS)	38 (M)	≥ 32	VCS.SC.M	0.05 × V + 1.36	
			0 (L)	< 32	VCS.SC.L	0.22 × V + 1.38	
		Horizontal closed transparent (HCT)	38 (M)	≥ 32	HCT.SC.M	0.06 × V + 0.37	
			0 (L)	< 32	HCT.SC.L	0.08 × V + 1.23	
		Horizontal closed solid (HCS)	38 (M)	≥ 32	HCS.SC.M	0.05 × V + 0.91	
			0 (L)	< 32	HCS.SC.L	0.06 × V + 1.12	
		Service over counter (SOC)	38 (M)	≥ 32	SOC.SC.M	0.52 × TDA + 1.00	
			0 (L)	< 32	SOC.SC.L	1.10 × TDA + 2.10	

(continued)

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TABLE C403.11.1—continued
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL REFRIGERATORS AND FREEZERS AND REFRIGERATION

EQUIPMENT CATEGORY	CONDENSING UNIT CONFIGURATION	EQUIPMENT FAMILY	RATING TEMP., °F	OPERATING TEMP., °F	EQUIPMENT CLASSIFICATION[a, c]	MAXIMUM DAILY ENERGY CONSUMPTION, kWh/day[d, e]	TEST STANDARD
Self-contained commercial refrigerators with transparent doors for pull-down temperature applications	Self-contained (SC)	Pull-down (PD)	38 (M)	≥ 32	PD.SC.M	0.11 × V + 0.81	AHRI 1200
Commercial ice cream freezers	Remote (RC)	Vertical open (VOP)	-15 (I)	≤ -5[b]	VOP.RC.I	2.79 × TDA + 8.70	AHRI 1200
		Semivertical open (SVO)			SVO.RC.I	2.79 × TDA + 8.70	
		Horizontal open (HZO)			HZO.RC.I	0.70 × TDA + 8.74	
		Vertical closed transparent (VCT)			VCT.RC.I	0.58 × TDA + 3.05	
		Horizontal closed transparent (HCT)			HCT.RC.I	0.40 × TDA + 0.31	
		Vertical closed solid (VCS)			VCS.RC.I	0.25 × V + 0.63	
		Horizontal closed solid (HCS)			HCS.RC.I	0.25 × V + 0.63	
		Service over counter (SOC)			SOC.RC.I	1.09 × TDA + 0.26	
	Self-contained (SC)	Vertical open (VOP)			VOP.SC.I	5.40 × TDA + 15.02	AHRI 1200
		Semivertical open (SVO)			SVO.SC.I	5.41 × TDA + 14.63	
		Horizontal open (HZO)			HZO.SC.I	2.42 × TDA + 9.00	
		Vertical closed transparent (VCT)			VCT.SC.I	0.62 × TDA + 3.29	
		Horizontal closed transparent (HCT)			HCT.SC.I	0.56 × TDA + 0.43	
		Vertical closed solid (VCS)			VCS.SC.I	0.34 × V + 0.88	
		Horizontal closed solid (HCS)			HCS.SC.I	0.34 × V + 0.88	
		Service over counter (SOC)			SOC.SC.I	1.53 × TDA + 0.36	

For SI: 1 square foot = 0.0929 m^2, 1 cubic foot = 0.02832 m^3, °C = (°F – 32)/1.8.

a. The meaning of the letters in this column is indicated in the columns to the left.

b. Ice cream freezer is defined in DOE 10 CFR 431.62 as a commercial freezer that is designed to operate at or below -5 °F and that the manufacturer designs, markets or intends for the storing, displaying or dispensing of ice cream.

c. Equipment class designations consist of a combination [in sequential order separated by periods (AAA).(BB).(C)] of the following:
- (AAA)—An equipment family code (VOP = vertical open, SVO = semivertical open, HZO = horizontal open, VCT = vertical closed transparent doors, VCS = vertical closed solid doors, HCT = horizontal closed transparent doors, HCS = horizontal closed solid doors, and SOC = service over counter);
- (BB)—An operating mode code (RC = remote condensing and SC = self-contained); and
- (C)—A rating temperature code [M = medium temperature (38°F), L = low temperature (0°F), or I = ice cream temperature (-15°F)].
- For example, "VOP.RC.M" refers to the "vertical open, remote condensing, medium temperature" equipment class.

d. V is the volume of the case (ft^3) as measured in AHRI 1200, Appendix C.

e. TDA is the total display area of the case (ft^2) as measured in AHRI 1200, Appendix D.

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C403.12.1 Duct and plenum insulation and sealing. Supply and return air ducts and plenums shall be insulated with not less than R-6 insulation where located in unconditioned spaces and where located outside the building with not less than R-8 insulation in *Climate Zones* 0 through 4 and not less than R-12 insulation in *Climate Zones* 5 through 8. Ducts located underground beneath buildings shall be insulated as required in this section or have an equivalent *thermal distribution efficiency*. Underground ducts utilizing the *thermal distribution efficiency* method shall be *listed* and *labeled* to indicate the *R*-value equivalency. Where located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by not less than R-8 insulation in *Climate Zones* 0 through 4 and not less than R-12 insulation in *Climate Zones* 5 through 8.

Exceptions:

1. Where located within equipment.
2. Where the design temperature difference between the interior and exterior of the duct or plenum is not greater than 15°F (8°C).

Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the *International Mechanical Code*.

C403.12.2 Duct construction. Ductwork shall be constructed and erected in accordance with the *International Mechanical Code*.

C403.12.2.1 Low-pressure duct systems. Longitudinal and transverse joints, seams and connections of supply and return ducts operating at a static pressure less than or equal to 2 inches water gauge (w.g.) (498 Pa) shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems or tapes installed in accordance with the manufacturer's instructions. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code*.

Exception: Locking-type longitudinal joints and seams, other than the snap-lock and button-lock types, need not be sealed as specified in this section.

C403.12.2.2 Medium-pressure duct systems. Ducts and plenums designed to operate at a static pressure greater than 2 inches water gauge (w.g.) (498 Pa) but less than 3 inches w.g. (747 Pa) shall be insulated and sealed in accordance with Section C403.12.1. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code.*

C403.12.2.3 High-pressure duct systems. Ducts and plenums designed to operate at static pressures equal to or greater than 3 inches water gauge (747 Pa) shall be insulated and sealed in accordance with Section C403.12.1. In addition, ducts and plenums shall be leak tested in accordance with the SMACNA HVAC Air Duct Leakage Test Manual and shown to have a rate of air leakage (CL) less than or equal to 4.0 as determined in accordance with Equation 4-8.

$$CL = F/P^{0.65} \qquad \textbf{(Equation 4-8)}$$

where:

F = The measured leakage rate in cfm per 100 square feet (9.3 m^2) of duct surface.

P = The static pressure of the test.

Documentation shall be furnished demonstrating that representative sections totaling not less than 25 percent of the duct area have been tested and that all tested sections comply with the requirements of this section.

C403.12.3 Piping insulation. Piping serving as part of a heating or cooling system shall be thermally insulated in accordance with Table C403.12.3.

Exceptions:

1. Factory-installed piping within HVAC equipment tested and rated in accordance with a test procedure referenced by this code.
2. Factory-installed piping within room fan-coils and unit ventilators tested and rated according to AHRI 440 (except that the sampling and variation provisions of Section 6.5 shall not apply) and AHRI 840, respectively.
3. Piping that conveys fluids that have a design operating temperature range between 60°F (15°C) and 105°F (41°C).
4. Piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
5. Strainers, control valves, and balancing valves associated with piping 1 inch (25 mm) or less in diameter.
6. Direct buried piping that conveys fluids at or below 60°F (15°C).
7. In radiant heating systems, sections of piping intended by design to radiate heat.

C403.12.3.1 Protection of piping insulation. Piping insulation exposed to the weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance and wind, and shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall not be permitted.

C403.13 Mechanical systems located outside of the building thermal envelope. Mechanical systems providing heat outside of the thermal envelope of a building shall comply with Sections C403.13.1 through C403.13.3.

C403.13.1 Heating outside a building. Systems installed to provide heat outside a building shall be radiant systems.

Such heating systems shall be controlled by an occupancy sensing device or a timer switch, so that the system is automatically de-energized when occupants are not present.

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C403.13.2 Snow- and ice-melt system controls. Snow- and ice-melting systems shall include automatic controls configured to shut off the system when the pavement temperature is above 50°F (10°C) and precipitation is not falling, and an automatic or manual control that is configured to shut off when the outdoor temperature is above 40°F (4°C).

C403.13.3 Freeze protection system controls. Freeze protection systems, such as heat tracing of outdoor piping and heat exchangers, including self-regulating heat tracing, shall include automatic controls configured to shut off the systems when outdoor air temperatures are above 40°F (4°C) or when the conditions of the protected fluid will prevent freezing.

C403.14 Operable opening interlocking controls. The heating and cooling systems shall have controls that will interlock these mechanical systems to the set temperatures of 90ºF (32ºC) for cooling and 55ºF (12.7ºC) for heating when the conditions of Section C402.5.8 exist. The controls shall configure to shut off the systems entirely when the outdoor temperatures are below 90ºF (32ºC) or above 55ºF (12.7ºC).

SECTION C404
SERVICE WATER HEATING

C404.1 General. This section covers the minimum efficiency of, and controls for, service water-heating equipment and insulation of service hot water piping.

C404.2 Service water-heating equipment performance efficiency. Water-heating equipment and hot water storage tanks shall meet the requirements of Table C404.2. The efficiency shall be verified through data furnished by the manufacturer of the equipment or through certification under an *approved* certification program. Water-heating equipment intended to be used to provide space heating shall meet the applicable provisions of Table C404.2.

C404.2.1 High input service water-heating systems. Gas-fired water-heating equipment installed in new buildings shall be in compliance with this section. Where a singular piece of water-heating equipment serves the entire building and the input rating of the equipment is 1,000,000 Btu/h (293 kW) or greater, such equipment shall have a thermal efficiency, E_t, of not less than 92 percent. Where multiple pieces of water-heating equipment serve the building and the combined input rating of the water-heating equipment is 1,000,000 Btu/h (293 kW) or greater, the combined input-capacity-weighted-average thermal efficiency, E_t, shall be not less than 90 percent.

Exceptions:

1. Where not less than 25 percent of the annual service water-heating requirement is provided by *on-site renewable energy* or site-recovered energy, the minimum thermal efficiency requirements of this section shall not apply.
2. The input rating of water heaters installed in individual dwelling units shall not be required to be included in the total input rating of service water-heating equipment for a building.
3. The input rating of water heaters with an input rating of not greater than 100,000 Btu/h (29.3 kW) shall not be required to be included in the total input rating of service water-heating equipment for a building.

TABLE C403.12.3
MINIMUM PIPE INSULATION THICKNESS (in inches)[a, c]

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (inches)				
	Conductivity Btu × in./(h × ft² × °F)[b]	Mean Rating Temperature, °F	< 1	1 to < 1 1/2	1 1/2 to < 4	4 to < 8	> 8
> 350	0.32–0.34	250	4.5	5.0	5.0	5.0	5.0
251–350	0.29–0.32	200	3.0	4.0	4.5	4.5	4.5
201–250	0.27–0.30	150	2.5	2.5	2.5	3.0	3.0
141–200	0.25–0.29	125	1.5	1.5	2.0	2.0	2.0
105–140	0.21–0.28	100	1.0	1.0	1.5	1.5	1.5
40–60	0.21–0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20–0.26	50	0.5	1.0	1.0	1.0	1.5

For SI: 1 inch = 25.4 mm, °C = [(°F) – 32]/1.8.

a. For piping smaller than 1 1/2 inches and located in partitions within conditioned spaces, reduction of these thicknesses by 1 inch shall be permitted (before thickness adjustment required in Note b) but not to a thickness less than 1 inch.

b. For insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows:

$T = r[(1 + t/r)^{K/k} - 1]$

where:

T = Minimum insulation thickness.

r = Actual outside radius of pipe.

t = Insulation thickness listed in the table for applicable fluid temperature and pipe size.

K = Conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature (Btu × in/h × ft² × °F).

k = The upper value of the conductivity range listed in the table for the applicable fluid temperature.

c. For direct-buried heating and hot water system piping, reduction of these thicknesses by 1 1/2 inches (38 mm) shall be permitted (before thickness adjustment required in Note b but not to thicknesses less than 1 inch.

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TABLE C404.2
MINIMUM PERFORMANCE OF WATER-HEATING EQUIPMENT

EQUIPMENT TYPE	SIZE CATEGORY (input)	SUBCATEGORY OR RATING CONDITION	PERFORMANCE REQUIRED[a, b]	TEST PROCEDURE
Water heaters, electric	≤ 12 kW[d]	Tabletop[e], ≥ 20 gallons and ≤ 120 gallons	0.93 – 0.00132V, EF	DOE 10 CFR Part 430
		Resistance ≥ 20 gallons and ≤ 55 gallons	0.960 – 0.0003V, EF	
		Grid-enabled[f] > 75 gallons and ≤ 120 gallons	1.061 – 0.00168V, EF	
	> 12 kW	Resistance	($0.3 + 27/V_m$), %/h	ANSI Z21.10.3
	≤ 24 amps and ≤ 250 volts	Heat pump > 55 gallons and ≤ 120 gallons	2.057 – 0.00113V, EF	DOE 10 CFR Part 430
Storage water heaters, gas	≤ 75,000 Btu/h	≥ 20 gallons and > 55 gallons	0.675 – 0.0015V, EF	DOE 10 CFR Part 430
		> 55 gallons and ≤ 100 gallons	0.8012 – 0.00078V, EF	
	> 75,000 Btu/h and ≤ 155,000 Btu/h	< 4,000 Btu/h/gal	80% E_t	ANSI Z21.10.3
			($Q/800 + 110\sqrt{V}$)SL, Btu/h	
	> 155,000 Btu/h	< 4,000 Btu/h/gal	80% E_t	
			($Q/800 + 110\sqrt{V}$)SL, Btu/h	
Instantaneous water heaters, gas	> 50,000 Btu/h and < 200,000 Btu/h[c]	≥ 4,000 Btu/h/gal and < 2 gal	0.82 – 0.00 19V, EF	DOE 10 CFR Part 430
	≥ 200,000 Btu/h	≥ 4,000 Btu/h/gal and < 10 gal	80% E_t	ANSI Z21.10.3
	≥ 200,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	80% E_t	
			($Q/800 + 110\sqrt{V}$)SL, Btu/h	
Storage water heaters, oil	≤ 105,000 Btu/h	≥ 20 gal and ≤ 50 gallons	0.68 – 0.0019V, EF	DOE 10 CFR Part 430
	≥ 105,000 Btu/h	< 4,000 Btu/h/gal	80% E_t	ANSI Z21.10.3
			($Q/800 + 110\sqrt{V}$)SL, Btu/h	
Instantaneous water heaters, oil	≤ 210,000 Btu/h	≥ 4,000 Btu/h/gal and < 2 gal	0.59 – 0.0019V, EF	DOE 10 CFR Part 430
	> 210,000 Btu/h	≥ 4,000 Btu/h/gal and < 10 gal	80% E_t	ANSI Z21.10.3
	> 210,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	78% E_t	
			($Q/800 + 110\sqrt{V}$)SL, Btu/h	
Hot water supply boilers, gas and oil	≥ 300,000 Btu/h and < 12,500,000 Btu/h	≥ 4,000 Btu/h/gal and < 10 gal	80% E_t	ANSI Z21.10.3
Hot water supply boilers, gas	≥ 300,000 Btu/h and < 12,500,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	80% E_t	
			($Q/800 + 110\sqrt{V}$)SL, Btu/h	
Hot water supply boilers, oil	> 300,000 Btu/h and < 12,500,000 Btu/h	> 4,000 Btu/h/gal and > 10 gal	78% E_t	
			($Q/800 + 110\sqrt{V}$)SL, Btu/h	
Pool heaters, gas and oil	All	—	82% E_t	ASHRAE 146
Heat pump pool heaters	All	—	4.0 COP	AHRI 1160
Unfired storage tanks	All	—	Minimum insulation requirement R-12.5 (h × ft² × °F)/Btu	(none)

(continued)

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TABLE C404.2—continued
MINIMUM PERFORMANCE OF WATER-HEATING EQUIPMENT

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2, °C = [(°F) – 32]/1.8, 1 British thermal unit per hour = 0.2931 W, 1 gallon = 3.785 L, 1 British thermal unit per hour per gallon = 0.078 W/L.

a. Energy factor (EF) and thermal efficiency (E_t) are minimum requirements. In the EF equation, V is the rated volume in gallons.

b. Standby loss (SL) is the maximum Btu/h based on a nominal 70°F temperature difference between stored water and ambient requirements. In the SL equation, Q is the nameplate input rate in Btu/h. In the equations for electric water heaters, V is the rated volume in gallons and V_m is the measured volume in gallons. In the SL equation for oil and gas water heaters and boilers, V is the rated volume in gallons.

c. Instantaneous water heaters with input rates below 200,000 Btu/h shall comply with these requirements where the water heater is designed to heat water to temperatures 180°F or higher.

d. Electric water heaters with an input rating of 12 kW (40,950 Btu/h) or less that are designed to heat water to temperatures of 180°F or greater shall comply with the requirements for electric water heaters that have an input rating greater than 12 kW (40,950 Btu/h).

e A tabletop water heater is a water heater that is enclosed in a rectangular cabinet with a flat top surface not more than 3 feet in height.

f. A grid-enabled water heater is an electric-resistance water heater that meets all of the following:

1. Has a rated storage tank volume of more than 75 gallons.
2. Was manufactured on or after April 16, 2015.
3. Is equipped at the point of manufacture with an activation lock.
4. Bears a permanent label applied by the manufacturer that complies with all of the following:
   4.1. Is made of material not adversely affected by water.
   4.2. Is attached by means of nonwater-soluble adhesive.
   4.3. Advises purchasers and end users of the intended and appropriate use of the product with the following notice printed in 16.5 point Arial Narrow Bold font: "IMPORTANT INFORMATION: This water heater is intended only for use as part of an electric thermal storage or demand response program. It will not provide adequate hot water unless enrolled in such a program and activated by your utility company or another program operator. Confirm the availability of a program in your local area before purchasing or installing this product."

C404.3 Heat traps for hot water storage tanks. Storage tank-type water heaters and hot water storage tanks that have vertical water pipes connecting to the inlet and outlet of the tank shall be provided with integral heat traps at those inlets and outlets or shall have pipe-configured heat traps in the piping connected to those inlets and outlets. Tank inlets and outlets associated with solar water heating system circulation loops shall not be required to have heat traps.

C404.4 Insulation of piping. Piping from a water heater to the termination of the heated water fixture supply pipe shall be insulated in accordance with Table C403.12.3. On both the inlet and outlet piping of a storage water heater or heated water storage tank, the piping to a heat trap or the first 8 feet (2438 mm) of piping, whichever is less, shall be insulated. Piping that is heat traced shall be insulated in accordance with Table C403.12.3 or the heat trace manufacturer's instructions. Tubular pipe insulation shall be installed in accordance with the insulation manufacturer's instructions. Pipe insulation shall be continuous except where the piping passes through a framing member. The minimum insulation thickness requirements of this section shall not supersede any greater insulation thickness requirements necessary for the protection of piping from freezing temperatures or the protection of personnel against external surface temperatures on the insulation.

Exception: Tubular pipe insulation shall not be required on the following:

1. The tubing from the connection at the termination of the fixture supply piping to a plumbing fixture or plumbing appliance.
2. Valves, pumps, strainers and threaded unions in piping that is 1 inch (25 mm) or less in nominal diameter.
3. Piping from user-controlled shower and bath mixing valves to the water outlets.
4. Cold-water piping of a demand recirculation water system.
5. Tubing from a hot drinking-water heating unit to the water outlet.
6. Piping at locations where a vertical support of the piping is installed.
7. Piping surrounded by building insulation with a thermal resistance (R-value) of not less than R-3.

C404.5 Heated water supply piping. Heated water supply piping shall be in accordance with Section C404.5.1 or C404.5.2. The flow rate through $^1/_4$-inch (6.4 mm) piping shall be not greater than 0.5 gpm (1.9 L/m). The flow rate through $^5/_{16}$-inch (7.9 mm) piping shall be not greater than 1 gpm (3.8 L/m). The flow rate through $^3/_8$-inch (9.5 mm) piping shall be not greater than 1.5 gpm (5.7 L/m).

C404.5.1 Maximum allowable pipe length method. The maximum allowable piping length from the nearest source of heated water to the termination of the fixture supply pipe shall be in accordance with the following. Where the piping contains more than one size of pipe, the largest size of pipe within the piping shall be used for determining the maximum allowable length of the piping in Table C404.5.1.

1. For a public lavatory faucet, use the "Public lavatory faucets" column in Table C404.5.1.
2. For all other plumbing fixtures and plumbing appliances, use the "Other fixtures and appliances" column in Table C404.5.1.

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TABLE C404.5.1
PIPING VOLUME AND MAXIMUM PIPING LENGTHS

NOMINAL PIPE SIZE (inches)	VOLUME (liquid ounces per foot length)	MAXIMUM PIPING LENGTH (feet)	
		Public lavatory faucets	Other fixtures and appliances
1/4	0.33	6	50
5/16	0.5	4	50
3/8	0.75	3	50
1/2	1.5	2	43
5/8	2	1	32
3/4	3	0.5	21
7/8	4	0.5	16
1	5	0.5	13
1 1/4	8	0.5	8
1 1/2	11	0.5	6
2 or larger	18	0.5	4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 liquid ounce = 0.030 L, 1 gallon = 128 ounces.

C404.5.2 Maximum allowable pipe volume method. The water volume in the piping shall be calculated in accordance with Section C404.5.2.1. Water heaters, circulating water systems and heat trace temperature maintenance systems shall be considered to be sources of heated water.

The volume from the nearest source of heated water to the termination of the fixture supply pipe shall be as follows:

1. For a public lavatory faucet: not more than 2 ounces (0.06 L).
2. For other plumbing fixtures or plumbing appliances; not more than 0.5 gallon (1.89 L).

C404.5.2.1 Water volume determination. The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters and manifolds between the nearest source of heated water and the termination of the fixture supply pipe. The volume in the piping shall be determined from the "Volume" column in Table C404.5.1 or from Table C404.5.2.1. The volume contained within fixture shutoff valves, within flexible water supply connectors to a fixture fitting and within a fixture fitting shall not be included in the water volume determination. Where heated water is supplied by a recirculating system or heat-traced piping, the volume shall include the portion of the fitting on the branch pipe that supplies water to the fixture.

C404.6 Heated-water circulating and temperature maintenance systems. Heated-water circulation systems shall be in accordance with Section C404.6.1. Heat trace temperature maintenance systems shall be in accordance with Section C404.6.2. Controls for hot water storage shall be in accordance with Section C404.6.3. Automatic controls, temperature sensors and pumps shall be in a location with *access*. Manual controls shall be in a location with *ready access*.

C404.6.1 Circulation systems. Heated-water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe or a cold water supply pipe. Gravity and thermo-syphon circulation systems shall be prohibited. Controls for circulating hot water system pumps shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is not a demand for hot water. The controls shall limit the temperature of the water entering the cold water piping to not greater than 104ºF (40°C).

C404.6.1.1 Demand recirculation controls. Demand recirculation water systems shall have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance, sensing the presence of a user of a fixture, or sensing the flow of hot or tempered water to a fixture fitting or appliance. **

C404.6.2 Heat trace systems. Electric heat trace systems shall comply with IEEE 515.1. Controls for such systems shall be able to automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy. Heat trace shall be arranged to be turned off automatically when there is not a demand for hot water.

C404.6.3 Controls for hot water storage. The controls on pumps that circulate water between a water heater and a heated-water storage tank shall limit operation of the pump from heating cycle startup to not greater than 5 minutes after the end of the cycle.

TABLE C404.5.2.1
INTERNAL VOLUME OF VARIOUS WATER DISTRIBUTION TUBING

	OUNCES OF WATER PER FOOT OF TUBE								
Nominal Size (inches)	Copper Type M	Copper Type L	Copper Type K	CPVC CTS SDR 11	CPVC SCH 40	CPVC SCH 80	PE-RT SDR 9	Composite ASTM F1281	PEX CTS SDR 9
3/8	1.06	0.97	0.84	N/A	1.17	—	0.64	0.63	0.64
1/2	1.69	1.55	1.45	1.25	1.89	1.46	1.18	1.31	1.18
3/4	3.43	3.22	2.90	2.67	3.38	2.74	2.35	3.39	2.35
1	5.81	5.49	5.17	4.43	5.53	4.57	3.91	5.56	3.91
1 1/4	8.70	8.36	8.09	6.61	9.66	8.24	5.81	8.49	5.81
1 1/2	12.18	11.83	11.45	9.22	13.20	11.38	8.09	13.88	8.09
2	21.08	20.58	20.04	15.79	21.88	19.11	13.86	21.48	13.86

For SI: 1 foot = 304.8 mm, 1 inch = 25.4 mm, 1 liquid ounce = 0.030 L, 1 oz/ft^2 = 305.15 g/m^2.
N/A = Not Available.

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C404.7 Drain water heat recovery units. Drain water heat recovery units shall comply with CSA B55.2. Potable water-side pressure loss shall be less than 10 psi (69 kPa) at maximum design flow. For *Group R* occupancies, the efficiency of drain water heat recovery unit efficiency shall be in accordance with CSA B55.1.

C404.8 Energy consumption of pools and permanent spas. The energy consumption of pools and permanent spas shall be controlled by the requirements in Sections C404.8.1 through C404.8.3.

C404.8.1 Heaters. The electric power to all heaters shall be controlled by an on-off switch that is an integral part of the heater, mounted on the exterior of the heater, or external to and within 3 feet (914 mm) of the heater in a location with *ready access*. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously burning ignition pilots.

C404.8.2 Time switches. Time switches or other control methods that can automatically turn off and on heaters and pump motors according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Pumps that operate solar- and waste-heat-recovery pool heating systems.

C404.8.3 Covers. Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other *approved* vapor-retardant means.

Exception: Where more than 75 percent of the energy for heating, computed over an operating season of not fewer than 3 calendar months, is from a heat pump or an on-site renewable energy system, covers or other vapor-retardant means shall not be required.

C404.9 Portable spas. The energy consumption of electric-powered portable spas shall be controlled by the requirements of APSP 14.

SECTION C405
ELECTRICAL POWER AND LIGHTING SYSTEMS

C405.1 General. Lighting system controls, the maximum lighting power for interior and exterior applications, and electrical energy consumption shall comply with this section. *Sleeping units* shall comply with Section C405.2.5 and with either Section C405.1.1 or C405.3. *General lighting* shall consist of all lighting included when calculating the total connected interior lighting power in accordance with Section C405.3.1 and which does not require specific application controls in accordance with Section C405.2.5.

Transformers, uninterruptable power supplies, motors and electrical power processing equipment in data center systems shall comply with Section 8 of ASHRAE 90.4 in addition to this code.

C405.1.1 Lighting for dwelling units. No less than 90 percent of the permanently installed lighting serving dwelling units, excluding kitchen appliance lighting, shall be provided by lamps with an efficacy of not less than 65 lm/W or luminaires with an efficacy of not less than 45 lm/W, or shall comply with Sections C405.2.4 and C405.3.

C405.2 Lighting controls. Lighting systems shall be provided with controls that comply with one of the following.

1. Lighting controls as specified in Sections C405.2.1 through C405.2.8.
2. Luminaire level lighting controls (LLLC) and lighting controls as specified in Sections C405.2.1, C405.2.5 and C405.2.6. The LLLC luminaire shall be independently capable of:
    2.1. Monitoring occupant activity to brighten or dim lighting when occupied or unoccupied, respectively.
    2.2. Monitoring ambient light, both electric light and daylight, and brighten or dim artificial light to maintain desired light level.
    2.3. For each control strategy, configuration and reconfiguration of performance parameters including; bright and dim setpoints, timeouts, dimming fade rates, sensor sensitivity adjustments, and wireless zoning configurations.

Exceptions: Lighting controls are not required for the following:

1. Areas designated as security or emergency areas that are required to be continuously lighted.
2. Interior exit stairways, interior exit ramps and exit passageways.
3. Emergency egress lighting that is normally off.

C405.2.1 Occupant sensor controls. Occupant *sensor controls* shall be installed to control lights in the following space types:

1. Classrooms/lecture/training rooms.
2. Conference/meeting/multipurpose rooms.
3. Copy/print rooms.
4. Lounges/breakrooms.
5. Enclosed offices.
6. Open plan office areas.
7. Restrooms.
8. Storage rooms.
9. Locker rooms.

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10. Corridors.
11. Warehouse storage areas.
12. Other spaces 300 square feet (28 m^2) or less that are enclosed by floor-to-ceiling height partitions.

Exception: Luminaires that are required to have specific application controls in accordance with Section C405.2.5.

C405.2.1.1 Occupant sensor control function. Occupant sensor controls in warehouses shall comply with Section C405.2.1.2. Occupant sensor controls in open plan office areas shall comply with Section C405.2.1.3. Occupant sensor controls in corridors shall comply with Section C405.2.1.4. Occupant sensor controls for all other spaces specified in Section C405.2.1 shall comply with the following:

1. They shall automatically turn off lights within 20 minutes after all occupants have left the space.
2. They shall be manual on or controlled to automatically turn on the lighting to not more than 50-percent power.
3. They shall incorporate a manual control to allow occupants to turn off lights.

Exception: Full automatic-on controls with no manual control shall be permitted in corridors, interior parking areas, stairways, restrooms, locker rooms, lobbies, library stacks and areas where manual operation would endanger occupant safety or security.

C405.2.1.2 Occupant sensor control function in warehouse storage areas. Lighting in warehouse storage areas shall be controlled as follows:

1. Lighting in each aisleway shall be controlled independently of lighting in all other aisleways and open areas.
2. Occupant sensors shall automatically reduce lighting power within each controlled area to an unoccupied setpoint of not more than 50 percent of full power within 20 minutes after all occupants have left the controlled area.
3. Lights that are not turned off by occupant sensors shall be turned off by time-switch control complying with Section C405.2.2.1.
4. A manual control shall be provided to allow occupants to turn off lights in the space.

C405.2.1.3 Occupant sensor control function in open plan office areas. Occupant sensor controls in open plan office spaces less than 300 square feet (28 m^2) in area shall comply with Section C405.2.1.1. Occupant sensor controls in all other open plan office spaces shall comply with all of the following:

1. The controls shall be configured so that general lighting can be controlled separately in control zones with floor areas not greater than 600 square feet (55 m^2) within the open plan office space.
2. General lighting in each control zone shall be permitted to automatically turn on upon occupancy within the control zone. General lighting in other unoccupied zones within the open plan office space shall be permitted to turn on to not more than 20 percent of full power or remain unaffected.
3. The controls shall automatically turn off general lighting in all control zones within 20 minutes after all occupants have left the open plan office space.

   Exception: Where general lighting is turned off by time-switch control complying with Section C405.2.2.1.
4. General lighting in each control zone shall turn off or uniformly reduce lighting power to an unoccupied setpoint of not more than 20 percent of full power within 20 minutes after all occupants have left the control zone.

C405.2.1.4 Occupant sensor control function in corridors. Occupant sensor controls in corridors shall uniformly reduce lighting power to an occupied setpoint not more than 50 percent of full power within 20 minutes after all occupants have left the space.

Exception: Corridors provided with less than two footcandles of illumination on the floor at the darkest point with all lights on.

C405.2.2 Time-switch controls. Each area of the building that is not provided with *occupant sensor controls* complying with Section C405.2.1.1 shall be provided with *time-switch controls* complying with Section C405.2.2.1.

Exceptions:

1. Luminaires that are required to have specific application controls in accordance with Section C405.2.4.
2. Spaces where patient care is directly provided.
3. Spaces where an automatic shutoff would endanger occupant safety or security.
4. Lighting intended for continuous operation.
5. Shop and laboratory classrooms.

C405.2.2.1 Time-switch control function. Time-switch *controls* shall comply with all of the following:

1. Automatically turn off lights when the space is scheduled to be unoccupied.
2. Have a minimum 7-day clock.
3. Be capable of being set for seven different day types per week.
4. Incorporate an automatic holiday "shutoff" feature, which turns off all controlled lighting

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loads for not fewer than 24 hours and then resumes normally scheduled operations.

5. Have program backup capabilities, which prevent the loss of program and time settings for not fewer than 10 hours, if power is interrupted.
6. Include an override switch that complies with the following:
   - 6.1. The override switch shall be a manual control.
   - 6.2. The override switch, when initiated, shall permit the controlled lighting to remain on for not more than 2 hours.
   - 6.3. Any individual override switch shall control the lighting for an area not larger than 5,000 square feet (465 m^2).

Exception: Within mall concourses, auditoriums, sales areas, manufacturing facilities and sports arenas:

1. The time limit shall be permitted to be greater than 2 hours, provided that the switch is a captive key device.
2. The area controlled by the override switch shall not be limited to 5,000 square feet (465 m^2) provided that such area is less than 20,000 square feet (1860 m^2).

* **C405.2.3 Light-reduction controls.** Where not provided with occupant sensor controls complying with Section C405.2.1.1, general lighting shall be provided with light-reduction controls complying with Section C405.2.3.1.

Exceptions:

1. Luminaires controlled by daylight responsive controls complying with Section C405.2.4.
2. Luminaires controlled by special application controls complying with Section C405.2.5.
3. Where provided with manual control, the following areas are not required to have light-reduction control:
   - 3.1. Spaces that have only one luminaire with a rated power of less than 60 watts.
   - 3.2. Spaces that use less than 0.45 watts per square foot (4.9 W/m²).
   - 3.3. Corridors, lobbies, electrical rooms and/or mechanical rooms.

** **C405.2.3.1 Light-reduction control function.** Spaces required to have light-reduction controls shall have a *manual control* that allows the occupant to reduce the connected lighting load by not less than 50 percent in a reasonably uniform illumination pattern with an intermediate step in addition to full on or off, or with continuous dimming control, using one of the following or another *approved* method:

1. Continuous dimming of all luminaires from full output to less than 20 percent of full power.
2. Switching all luminaires to a reduced output of not less than 30 percent and not more than 70 percent of full power.
3. Switching alternate luminaires or alternate rows of luminaires to achieve a reduced output of not less than 30 percent and not more than 70 percent of full power.

** **C405.2.4 Daylight-responsive controls.** *Daylight-responsive controls* complying with Section C405.2.4.1 shall be provided to control the general lighting within *daylight zones* in the following spaces:

1. Spaces with a total of more than 150 watts of *general lighting* within primary sidelit daylight zones complying with Section C405.2.4.2.
2. Spaces with a total of more than 300 watts of *general lighting* within sidelit daylight zones complying with Section C405.2.4.2.
3. Spaces with a total of more than 150 watts of *general lighting* within toplit daylight zones complying with Section C405.2.4.3.

Exceptions: Daylight responsive controls are not required for the following:

1. Spaces in health care facilities where patient care is directly provided.
2. Sidelit daylight zones on the first floor above grade in Group A-2 and Group M occupancies.
3. New buildings where the total connected lighting power calculated in accordance with Section C405.3.1 is not greater than the adjusted interior lighting power allowance (LPA_{adj}) calculated in accordance with Equation 4-9.

$$LPA_{adj} = [LPA_{norm} \times (1.0 - 0.4 \times UDZFA / TBFA)] \quad \textbf{(Equation 4-9)}$$

where:

LPA_{adj} = Adjusted building interior lighting power allowance in watts.

LPA_{norm} = Normal building lighting power allowance in watts calculated in accordance with Section C405.3.2 and reduced in accordance with Section C406.3 where Option 2 of Section C406.1 is used to comply with the requirements of Section C406.

$UDZFA$ = Uncontrolled daylight zone floor area is the sum of all sidelit and toplit zones, calculated in accor-

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dance with Sections C405.2.4.2 and C405.2.4.3, that do not have daylight responsive controls.

TBFA = Total building floor area is the sum of all floor areas included in the lighting power allowance calculation in Section C405.3.2.

C405.2.4.1 Daylight-responsive control function. Where required, *daylight-responsive controls* shall be provided within each space for control of lights in that space and shall comply with all of the following:

1. Lights in *toplit daylight zones* in accordance with Section C405.2.4.3 shall be controlled independently of lights in sidelit daylight zones in accordance with Section C405.2.4.2.
2. Lights in the primary sidelit daylight zone shall be controlled independently of lights in the secondary sidelit daylight zone.
3. *Daylight responsive controls* within each space shall be configured so that they can be calibrated from within that space by authorized personnel.
4. Calibration mechanisms shall be in a location with *ready access*.
5. *Daylight responsive controls* shall dim lights continuously from full light output to 15 percent of full light output or lower.
6. *Daylight responsive controls* shall be configured to completely shut off all controlled lights.
7. When occupant sensor controls have reduced the lighting power to an unoccupied setpoint in accordance with Sections C405.2.1.2 through C405.2.1.4, daylight responsive controls shall continue to adjust electric light levels in response to available daylight, but shall be configured to not increase the lighting power above the specified unoccupied setpoint.
8. Lights in *sidelit daylight zones* in accordance with Section C405.2.4.2 facing different cardinal orientations [within 45 degrees (0.79 rad) of due north, east, south, west] shall be controlled independently of each other.

Exceptions:

1. Within each space, up to 150 watts of lighting within the primary sidelit daylight zone is permitted to be controlled together with lighting in a primary sidelit daylight zone facing a different cardinal orientation.
2. Within each space, up to 150 watts of lighting within the secondary sidelit daylight zone is permitted to be controlled together with lighting in a secondary sidelit daylight zone facing a different cardinal orientation.

C405.2.4.2 Sidelit daylight zone. The sidelit daylight zone is the floor area adjacent to vertical *fenestration* that complies with all of the following:

1. Where the fenestration is located in a wall, the sidelit daylight zone shall extend laterally to the nearest full-height wall, or up to 1.0 times the height from the floor to the top of the fenestration, and longitudinally from the edge of the fenestration to the nearest full-height wall, or up to 0.5 times the height from the floor to the top of the fenestration, whichever is less, as indicated in Figure C405.2.4.2(1).
2. Where the fenestration is located in a rooftop monitor, the sidelit daylight zone shall extend laterally to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 1.0 times the height from the floor to the bottom of the fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 0.25 times the height from the floor to the bottom of the fenestration, whichever is less, as indicated in Figures C405.2.4.2(2) and C405.2.4.2(3).
3. The secondary sidelit daylight zone is directly adjacent to the primary sidelit daylight zone and shall extend laterally to 2.0 times the height from the floor to the top of the fenestration or to the nearest full height wall, whichever is less, and longitudinally from the edge of the fenestration to the nearest full height wall, or up to 0.5 times the height from the floor to the top of the fenestration, whichever is less, as indicated in Figure C405.2.4.2(1). The area of secondary sidelit zones shall not be considered in the calculation of the daylight zones in Section C402.4.1.1.
4. The area of the fenestration is not less than 24 square feet (2.23 m^2).
5. The distance from the fenestration to any building or geological formation that would block *access to* daylight is greater than one-half of the height from the bottom of the fenestration to the top of the building or geologic formation.
6. The visible transmittance of the fenestration is not less than 0.20.
7. The projection factor (determined in accordance with Equation 4-5) for any overhanging projection that is shading the fenestration is not greater than 1.0 for fenestration oriented 45 degrees or less from true north and not greater than 1.5 for all other orientations.

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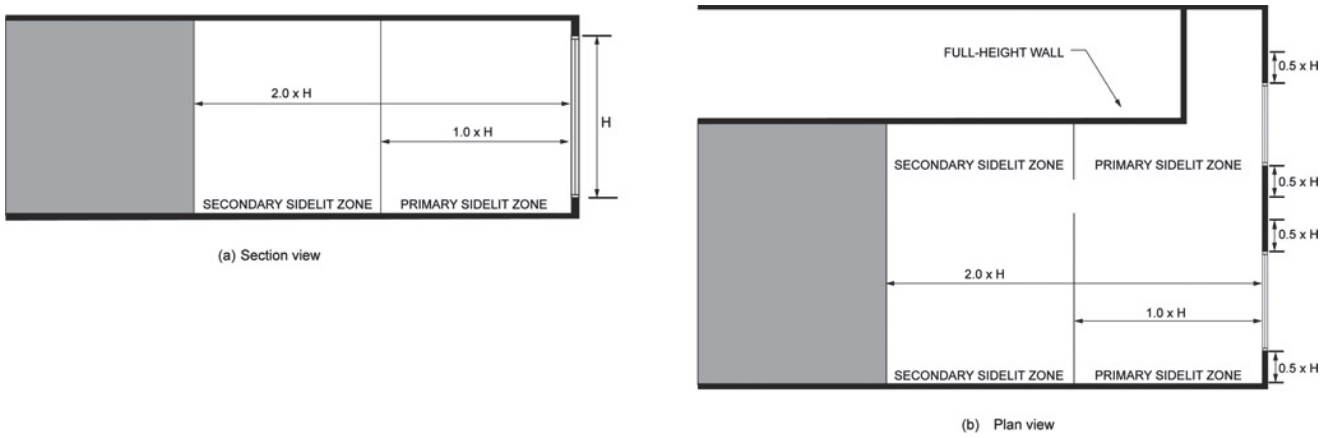
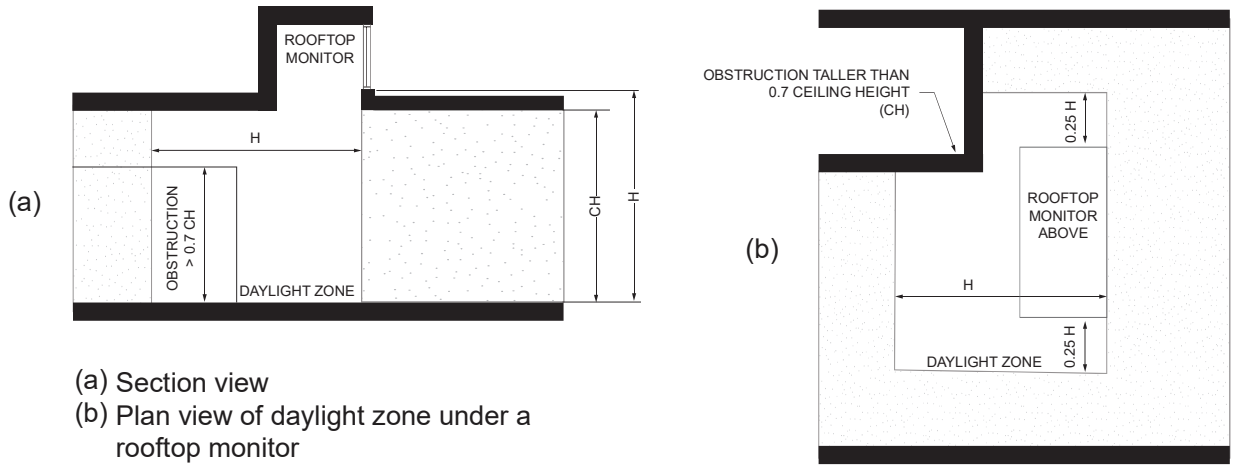
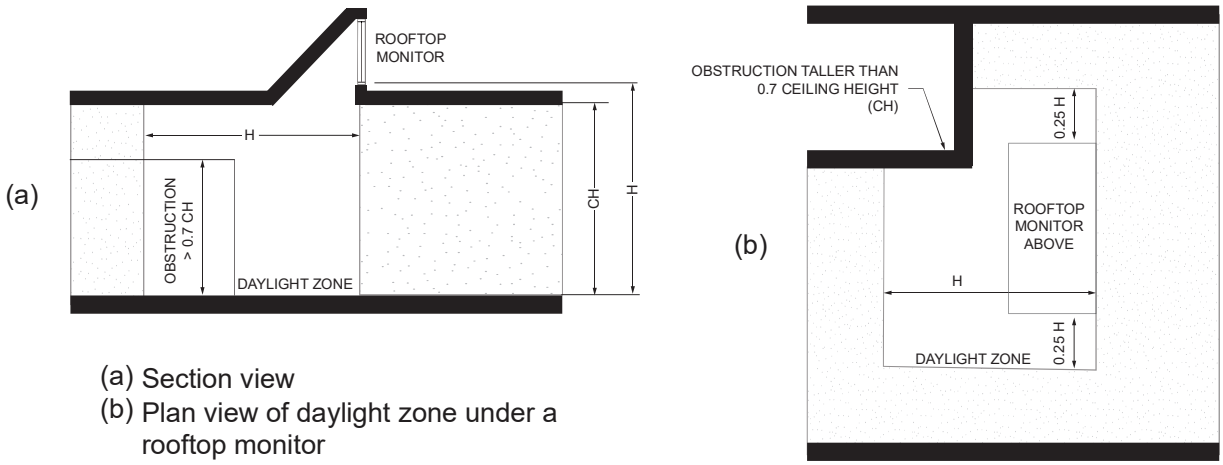


FIGURE C405.2.4.2(1)
PRIMARY AND SECONDARY SIDELIT DAYLIGHT ZONES



(a) Section view
(b) Plan view of daylight zone under a rooftop monitor

FIGURE C405.2.4.2(2)
DAYLIGHT ZONE UNDER A ROOFTOP MONITOR



(a) Section view
(b) Plan view of daylight zone under a rooftop monitor

FIGURE C405.2.4.2(3)
DAYLIGHT ZONE UNDER A SLOPED ROOFTOP MONITOR

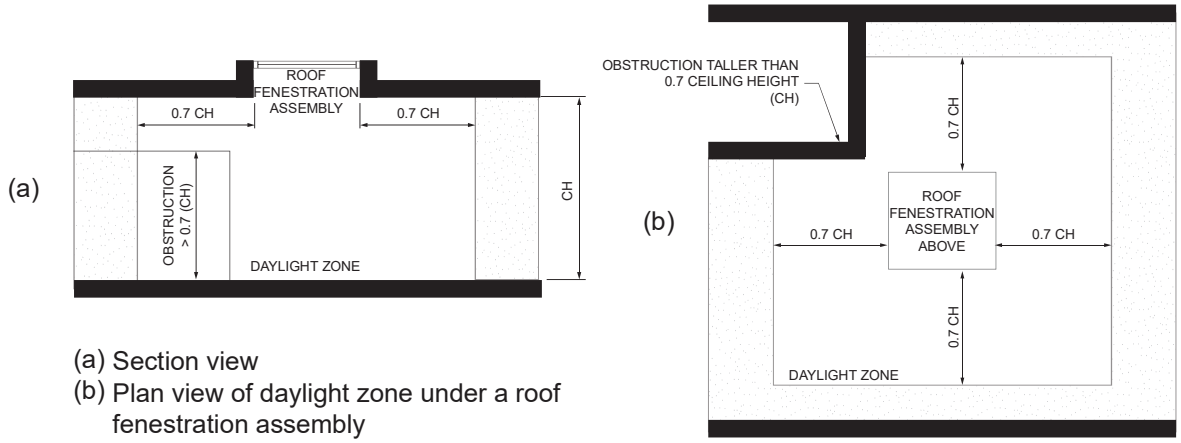
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C405.2.4.3 Toplit daylight zone. The *toplit daylight zone* is the floor area underneath a roof fenestration assembly that complies with all of the following:

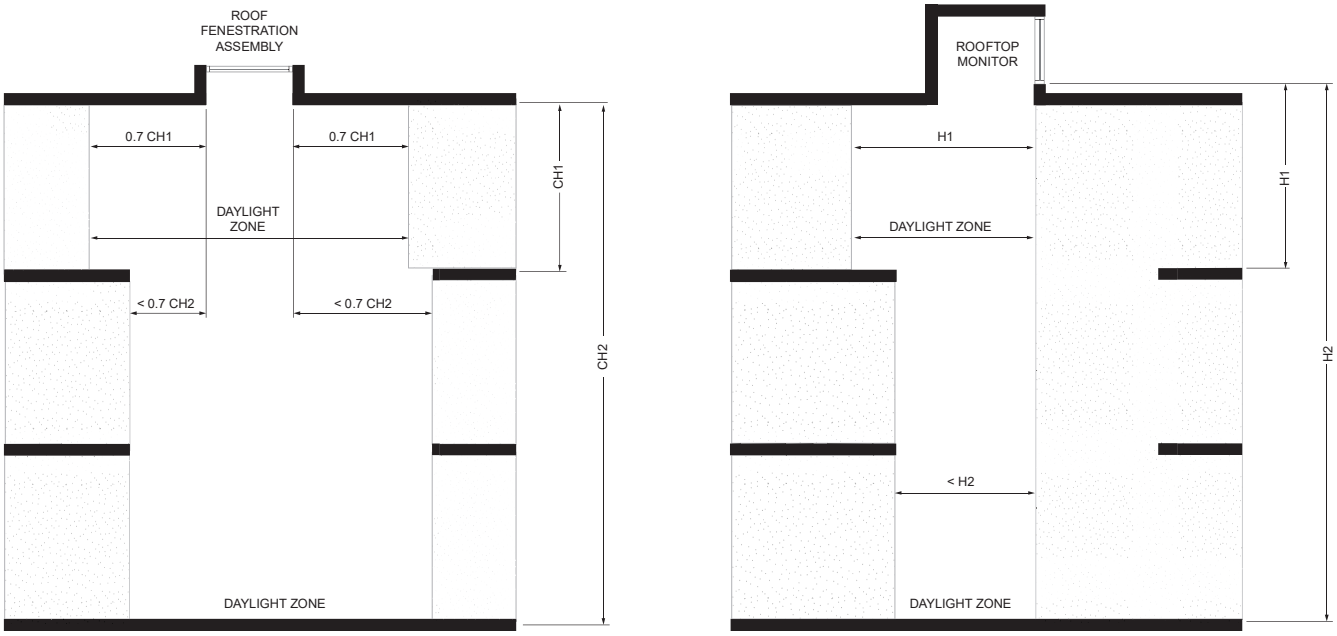
1. The toplit daylight zone shall extend laterally and longitudinally beyond the edge of the roof fenestration assembly to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 0.7 times the ceiling height, whichever is less, as indicated in Figure C405.2.4.3.
2. Direct sunlight is not blocked from hitting the roof fenestration assembly at the peak solar angle on the summer solstice by buildings or geological formations.
3. The product of the visible transmittance of the roof fenestration assembly and the area of the rough opening of the roof fenestration assembly divided by the area of the *toplit* zone is not less than 0.008.

C405.2.4.4 Atriums. Daylight zones at atrium spaces shall be established at the top floor surrounding the atrium and at the floor of the atrium space, and not on intermediate floors, as indicated in Figure C405.2.4.4.



(a) Section view
(b) Plan view of daylight zone under a roof fenestration assembly

FIGURE C405.2.4.3
TOPLIT DAYLIGHT ZONE



(a) Section view of roof fenestration assembly at atrium

(b) Section view of roof monitor at atrium

C405.2.4.4
DAYLIGHT ZONES AT A MULTISTORY ATRIUM

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C405.2.5 Specific application controls. Specific application controls shall be provided for the following:

1. The following lighting shall be controlled by an occupant sensor complying with Section C405.2.1.1 or a time-switch control complying with Section C405.2.2.1. In addition, a manual control shall be provided to control such lighting separately from the general lighting in the space:
   1.1. Luminaires for which additional lighting power is claimed in accordance with Section C405.3.2.2.1.
   1.2. Display and accent.
   1.3. Lighting in display cases.
   1.4. Supplemental task lighting, including permanently installed under-shelf or under-cabinet lighting.
   1.5. Lighting equipment that is for sale or demonstration in lighting education.
   1.6. Display lighting for exhibits in galleries, museums and monuments that is in addition to *general lighting*.
2. *Sleeping units* shall have control devices or systems that are configured to automatically switch off all permanently installed luminaires and switched receptacles within 20 minutes after all occupants have left the unit.

   Exceptions:

   1. Lighting and switched receptacles controlled by card key controls.
   2. Spaces where patient care is directly provided.
3. Permanently installed luminaires within *dwelling units* shall be provided with controls complying with Section C405.2.1.1 or C405.2.3.1.
4. Lighting for nonvisual applications, such as plant growth and food warming, shall be controlled by a time switch control complying with Section C405.2.2.1 that is independent of the controls for other lighting within the room or space.
5. Task lighting for medical and dental purposes that is in addition to *general lighting* shall be provided with a *manual control*.

C405.2.6 Manual controls. Where required by this code, manual controls for lights shall comply with the following:

1. They shall be in a location with *ready access* to occupants.
2. They shall be located where the controlled lights are visible, or shall identify the area served by the lights and indicate their status.

C405.2.7 Exterior lighting controls. Exterior lighting systems shall be provided with controls that comply with Sections C405.2.7.1 through C405.2.7.4.

Exceptions:

1. Lighting for covered vehicle entrances and exits from buildings and parking structures where required for eye adaptation.
2. Lighting controlled from within dwelling units.

C405.2.7.1 Daylight shutoff. Lights shall be automatically turned off when daylight is present and satisfies the lighting needs.

C405.2.7.2 Building facade and landscape lighting. Building facade and landscape lighting shall automatically shut off from not later than 1 hour after business closing to not earlier than 1 hour before business opening.

C405.2.7.3 Lighting setback. Lighting that is not controlled in accordance with Section C405.2.7.2 shall comply with the following:

1. Be controlled so that the total wattage of such lighting is automatically reduced by not less than 50 percent by selectively switching off or dimming luminaires at one of the following times:
   1.1. From not later than midnight to not earlier than 6 a.m.
   1.2. From not later than one hour after business closing to not earlier than one hour before business opening.
   1.3. During any time where activity has not been detected for 15 minutes or more.
2. Luminaires serving outdoor parking areas and having a rated input wattage of greater than 78 watts and a mounting height of 24 feet (7315 mm) or less above the ground shall be controlled so that the total wattage of such lighting is automatically reduced by not less than 50 percent during any time where activity has not been detected for 15 minutes or more. Not more than 1,500 watts of lighting power shall be controlled together.

C405.2.7.4 Exterior time-switch control function. Time-switch controls for exterior lighting shall comply with the following:

1. They shall have a clock capable of being programmed for not fewer than 7 days.
2. They shall be capable of being set for seven different day types per week.
3. They shall incorporate an automatic holiday setback feature.

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4. They shall have program backup capabilities that prevent the loss of program and time settings for a period of not less than 10 hours in the event that power is interrupted.

C405.2.8 Parking garage lighting control. Parking garage lighting shall be controlled by an *occupant sensor* complying with Section C405.2.1.1 or a *time-switch control* complying with Section C405.2.2.1. Additional lighting controls shall be provided as follows:

1. Lighting power of each luminaire shall be automatically reduced by not less than 30 percent when there is no activity detected within a lighting zone for 20 minutes. Lighting zones for this requirement shall be not larger than 3,600 square feet (334.5 m^2).

   Exception: Lighting zones provided with less than 1.5 footcandles of illumination on the floor at the darkest point with all lights on are not required to have automatic light-reduction controls.

2. Where lighting for eye adaptation is provided at covered vehicle entrances and exits from buildings and parking structures, such lighting shall be separately controlled by a device that automatically reduces lighting power by at least 50 percent from sunset to sunrise.
3. The power to luminaires within 20 feet (6096 mm) of perimeter wall openings shall automatically reduce in response to daylight by at least 50 percent.

Exceptions:

1. Where the opening-to-wall ratio is less than 40 percent as viewed from the interior and encompassing the vertical distance from the driving surface to the lowest structural element.
2. Where the distance from the opening to any exterior daylight blocking obstruction is less than one-half the height from the bottom of the opening or fenestration to the top of the obstruction.
3. Where openings are obstructed by permanent screens or architectural elements restricting daylight entering the interior space.

C405.3 Interior lighting power requirements. A building complies with this section where its total connected interior lighting power calculated under Section C405.3.1 is not greater than the interior lighting power allowance calculated under Section C405.3.2.

C405.3.1 Total connected interior lighting power. The total connected interior lighting power shall be determined in accordance with Equation 4-10.

$$TCLP = [LVL + BLL + LED + TRK + \text{Other}] \quad \textbf{(Equation 4-10)}$$

where:

TCLP = Total connected lighting power (watts).

LVL = For luminaires with lamps connected directly to building power, such as line voltage lamps, the rated wattage of the lamp.

BLL = For luminaires incorporating a ballast or transformer, the rated input wattage of the ballast or transformer when operating that lamp.

LED = For light-emitting diode luminaires with either integral or remote drivers, the rated wattage of the luminaire.

TRK = For lighting track, cable conductor, rail conductor, and plug-in busway systems that allow the addition and relocation of luminaires without rewiring, the wattage shall be one of the following:

1. The specified wattage of the luminaires, but not less than 8 W per linear foot (25 W/lin m).
2. The wattage limit of the permanent current-limiting devices protecting the system.
3. The wattage limit of the transformer supplying the system.

Other = The wattage of all other luminaires and lighting sources not covered previously and associated with interior lighting verified by data supplied by the manufacturer or other *approved* sources.

The connected power associated with the following lighting equipment and applications is not included in calculating total connected lighting power.

1. Television broadcast lighting for playing areas in sports arenas.
2. Emergency lighting automatically off during normal building operation.
3. Lighting in spaces specifically designed for use by occupants with special lighting needs, including those with visual impairment and other medical and age-related issues.
4. Casino gaming areas.
5. Mirror lighting in dressing rooms.
6. Task lighting for medical and dental purposes that is in addition to general lighting.
7. Display lighting for exhibits in galleries, museums and monuments that is in addition to general lighting.
8. Lighting for theatrical purposes, including performance, stage, film production and video production.
9. Lighting for photographic processes.

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10. Lighting integral to equipment or instrumentation and installed by the manufacturer.
11. Task lighting for plant growth or maintenance.
12. Advertising signage or directional signage.
13. Lighting for food warming.
14. Lighting equipment that is for sale.
15. Lighting demonstration equipment in lighting education facilities.
16. Lighting approved because of safety considerations.
17. Lighting in retail display windows, provided that the display area is enclosed by ceiling-height partitions.
18. Furniture-mounted supplemental task lighting that is controlled by automatic shutoff.
19. Exit signs.
20. Antimicrobial lighting used for the sole purpose of disinfecting a space.

C405.3.2 Interior lighting power allowance. The total interior lighting power allowance (watts) for an entire building shall be determined according to Table C405.3.2(1) using the Building Area Method or Table C405.3.2(2) using the Space-by-Space Method. The interior lighting power allowance for projects that involve only portions of a building shall be determined according to Table C405.3.2(2) using the Space-by-Space Method. Buildings with unfinished spaces shall use the Space-by-Space Method.

TABLE C405.3.2(1)
INTERIOR LIGHTING POWER ALLOWANCES: BUILDING AREA METHOD

BUILDING AREA TYPE	LPD (watts/ft^2)
Automotive facility	0.75
Convention center	0.64
Courthouse	0.79
Dining: bar lounge/leisure	0.80
Dining: cafeteria/fast food	0.76
Dining: family	0.71
Dormitory[a, b]	0.53
Exercise center	0.72
Fire station[a]	0.56
Gymnasium	0.76
Health care clinic	0.81
Hospital[a]	0.96
Hotel/Motel[a, b]	0.56
Library	0.83
Manufacturing facility	0.82
Motion picture theater	0.44
Multiple-family[c]	0.45
Museum	0.55
Office	0.64

(continued)

TABLE C405.3.2(1)—continued
INTERIOR LIGHTING POWER ALLOWANCES: BUILDING AREA METHOD

BUILDING AREA TYPE	LPD (watts/ft^2)
Parking garage	0.18
Penitentiary	0.69
Performing arts theater	0.84
Police station	0.66
Post office	0.65
Religious building	0.67
Retail	0.84
School/university	0.72
Sports arena	0.76
Town hall	0.69
Transportation	0.50
Warehouse	0.45
Workshop	0.91

For SI: 1 watt per square foot = 10.76 w/m^2.

a. Where sleeping units are excluded from lighting power calculations by application of Section R404.1, neither the area of the sleeping units nor the wattage of lighting in the sleeping units is counted.

b. Where dwelling units are excluded from lighting power calculations by application of Section R404.1, neither the area of the dwelling units nor the wattage of lighting in the dwelling units is counted.

c. Dwelling units are excluded. Neither the area of the dwelling units nor the wattage of lighting in the dwelling units is counted.

TABLE C405.3.2(2)
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

COMMON SPACE TYPES[a]	LPD (watts/ft^2)
Atrium	
Less than 40 feet in height	0.48
Greater than 40 feet in height	0.60
Audience seating area	
In an auditorium	0.61
In a gymnasium	0.23
In a motion picture theater	0.27
In a penitentiary	0.67
In a performing arts theater	1.16
In a religious building	0.72
In a sports arena	0.33
Otherwise	0.33
Banking activity area	0.61
Breakroom (See Lounge/breakroom)	
Classroom/lecture hall/training room	
In a penitentiary	0.89
Otherwise	0.71
Computer room, data center	0.94
Conference/meeting/multipurpose room	0.97
Copy/print room	0.31

(continued)

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TABLE C405.3.2(2)—continued
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

COMMON SPACE TYPES[a]	LPD (watts/ft²)
Corridor	
In a facility for the visually impaired (and not used primarily by the staff)[b]	0.71
In a hospital	0.71
Otherwise	0.41
Courtroom	1.20
Dining area	
In bar/lounge or leisure dining	0.86
In cafeteria or fast food dining	0.40
In a facility for the visually impaired (and not used primarily by the staff)[b]	1.27
In family dining	0.60
In a penitentiary	0.42
Otherwise	0.43
Electrical/mechanical room	0.43
Emergency vehicle garage	0.52
Food preparation area	1.09
Guestroom[c, d]	0.41
Laboratory	
In or as a classroom	1.11
Otherwise	1.33
Laundry/washing area	0.53
Loading dock, interior	0.88
Lobby	
For an elevator	0.65
In a facility for the visually impaired (and not used primarily by the staff)[b]	1.69
In a hotel	0.51
In a motion picture theater	0.23
In a performing arts theater	1.25
Otherwise	0.84
Locker room	0.52
Lounge/breakroom	
In a healthcare facility	0.42
Otherwise	0.59
Office	
Enclosed	0.74
Open plan	0.61
Parking area, interior	0.15
Pharmacy area	1.66
Restroom	
In a facility for the visually impaired (and not used primarily by the staff[b]	1.26
Otherwise	0.63
Sales area	1.05

TABLE C405.3.2(2)—continued
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

COMMON SPACE TYPES[a]	LPD (watts/ft²)
Seating area, general	0.23
Stairwell	0.49
Storage room	0.38
Vehicular maintenance area	0.60
Workshop	1.26
BUILDING TYPE SPECIFIC SPACE TYPES[a]	**LPD (watts/ ft²)**
Automotive (see Vehicular maintenance area)	
Convention Center—exhibit space	0.61
Dormitory—living quarters[c, d]	0.50
Facility for the visually impaired[b]	
In a chapel (and not used primarily by the staff)	0.70
In a recreation room (and not used primarily by the staff)	1.77
Fire Station—sleeping quarters[c]	0.23
Gymnasium/fitness center	
In an exercise area	0.90
In a playing area	0.85
Healthcare facility	
In an exam/treatment room	1.40
In an imaging room	0.94
In a medical supply room	0.62
In a nursery	0.92
In a nurse's station	1.17
In an operating room	2.26
In a patient room[c]	0.68
In a physical therapy room	0.91
In a recovery room	1.25
Library	
In a reading area	0.96
In the stacks	1.18
Manufacturing facility	
In a detailed manufacturing area	0.80
In an equipment room	0.76
In an extra-high-bay area (greater than 50 feet floor-to-ceiling height)	1.42
In a high-bay area (25–50 feet floor-to-ceiling height)	1.24
In a low-bay area (less than 25 feet floor-to-ceiling height)	0.86
Museum	
In a general exhibition area	0.31
In a restoration room	1.10
Performing arts theater—dressing room	0.41
Post office—sorting area	0.76

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TABLE C405.3.2(2)—continued
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

COMMON SPACE TYPES[a]	LPD (watts/ft²)
Religious buildings	
In a fellowship hall	0.54
In a worship/pulpit/choir area	0.85
Retail facilities	
In a dressing/fitting room	0.51
In a mall concourse	0.82
Sports arena—playing area	
For a Class I facility[e]	2.94
For a Class II facility[f]	2.01
For a Class III facility[g]	1.30
For a Class IV facility[h]	0.86
Transportation facility	
At a terminal ticket counter	0.51
In a baggage/carousel area	0.39
In an airport concourse	0.25
Warehouse—storage area	
For medium to bulky, palletized items	0.33
For smaller, hand-carried items	0.69

For SI: 1 foot = 304.8 mm, 1 watt per square foot = 10.76 w/m^2.

a. In cases where both a common space type and a building area specific space type are listed, the building area specific space type shall apply.
b. A 'Facility for the Visually Impaired' is a facility that is licensed or will be licensed by local or state authorities for senior long-term care, adult daycare, senior support or people with special visual needs.
c. Where sleeping units are excluded from lighting power calculations by application of Section R404.1, neither the area of the sleeping units nor the wattage of lighting in the sleeping units is counted.
d. Where dwelling units are excluded from lighting power calculations by application of Section R404.1, neither the area of the dwelling units nor the wattage of lighting in the dwelling units is counted.
e. Class I facilities consist of professional facilities; and semiprofessional, collegiate, or club facilities with seating for 5,000 or more spectators.
f. Class II facilities consist of collegiate and semiprofessional facilities with seating for fewer than 5,000 spectators; club facilities with seating for between 2,000 and 5,000 spectators; and amateur league and high school facilities with seating for more than 2,000 spectators.
g. Class III facilities consist of club, amateur league and high school facilities with seating for 2,000 or fewer spectators.
h. Class IV facilities consist of elementary school and recreational facilities; and amateur league and high school facilities without provision for spectators.

C405.3.2.1 Building Area Method. For the Building Area Method, the interior lighting power allowance is calculated as follows:

1. For each building area type inside the building, determine the applicable building area type and the allowed lighting power density for that type from Table C405.3.2(1). For building area types not listed, select the building area type that most closely represents the use of that area. For the purposes of this method, an "area" shall be defined as all contiguous spaces that accommodate or are associated with a single building area type.
2. Determine the floor area for each building area type listed in Table C405.3.2(1) and multiply this area by the applicable value from Table C405.3.2(1) to determine the lighting power (watts) for each building area type.
3. The total interior lighting power allowance (watts) for the entire building is the sum of the lighting power from each building area type.

C405.3.2.2 Space-by-Space Method. Where a building has unfinished spaces, the lighting power allowance for the unfinished spaces shall be the total connected lighting power for those spaces, or 0.2 watts per square foot (10.76 w/m^2), whichever is less. For the Space-by-Space Method, the interior lighting power allowance is calculated as follows:

1. For each space enclosed by partitions that are not less than 80 percent of the ceiling height, determine the applicable space type from Table C405.3.2(2). For space types not listed, select the space type that most closely represents the proposed use of the space. Where a space has multiple functions, that space may be divided into separate spaces.
2. Determine the total floor area of all the spaces of each space type and multiply by the value for the space type in Table C405.3.2(2) to determine the lighting power (watts) for each space type.
3. The total interior lighting power allowance (watts) shall be the sum of the lighting power allowances for all space types.

C405.3.2.2.1 Additional interior lighting power. Where using the Space-by-Space Method, an increase in the interior lighting power allowance is permitted for specific lighting functions. Additional power shall be permitted only where the specified lighting is installed and controlled in accordance with Section C405.2.5. This additional power shall be used only for the specified luminaires and shall not be used for any other purpose. An increase in the interior lighting power allowance is permitted in the following cases:

1. For lighting equipment to be installed in sales areas specifically to highlight merchandise, the additional lighting power shall be determined in accordance with Equation 4-11.

   Additional interior lighting power allowance = 1000 W + (Retail Area 1 × 0.45 W/ft^2) + (Retail Area 2 × 0.45W/ft^2) + (Retail Area 3 × 1.05 W/ft^2) + (Retail Area 4 × 1.87 W/ft^2)

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For SI units:

Additional interior lighting power allowance = 1000 W + (Retail Area 1 × 4.8 W/m^2) + (Retail Area 2 × 4.84 W/m^2) + (Retail Area 3 × 11 W/m^2) + (Retail Area 4 × 20 W/m^2) **(Equation 4-11)**

where:

Retail Area 1 = The floor area for all products not listed in Retail Area 2, 3 or 4.

Retail Area 2 = The floor area used for the sale of vehicles, sporting goods and small electronics.

Retail Area 3 = The floor area used for the sale of furniture, clothing, cosmetics and artwork.

Retail Area 4 = The floor area used for the sale of jewelry, crystal and china.

Exception: Other merchandise categories are permitted to be included in Retail Areas 2 through 4, provided that justification documenting the need for additional lighting power based on visual inspection, contrast or other critical display is approved by the code official.

2. For spaces in which lighting is specified to be installed in addition to the general lighting for the purpose of decorative appearance or for highlighting art or exhibits, provided that the additional lighting power shall be not more than 0.9 W/ft^2 (9.7 W/m^2) in lobbies and not more than 0.75 W/ft^2 (8.1 W/m^2) in other spaces.

C405.4 Lighting for plant growth and maintenance. Not less than 95 percent of the permanently installed luminaires used for plant growth and maintenance shall have a photon efficiency of not less than 1.6 µmol/J as defined in accordance with ANSI/ASABE S640.

C405.5 Exterior lighting power requirements. The total connected exterior lighting power calculated in accordance with Section C405.5.1 shall be not greater than the exterior lighting power allowance calculated in accordance with Section C405.5.2.

C405.5.1 Total connected exterior building exterior lighting power. The total exterior connected lighting power shall be the total maximum rated wattage of all lighting that is powered through the energy service for the building.

Exception: Lighting used for the following applications shall not be included.

1. Lighting *approved* because of safety considerations.
2. Emergency lighting automatically off during normal business operation.
3. Exit signs.
4. Specialized signal, directional and marker lighting associated with transportation.
5. Advertising signage or directional signage.
6. Integral to equipment or instrumentation and installed by its manufacturer.
7. Theatrical purposes, including performance, stage, film production and video production.
8. Athletic playing areas.
9. Temporary lighting.
10. Industrial production, material handling, transportation sites and associated storage areas.
11. Theme elements in theme/amusement parks.
12. Used to highlight features of art, public monuments and the national flag.
13. Lighting for water features and swimming pools.
14. Lighting controlled from within dwelling units, where the lighting complies with Section R404.1.

C405.5.2 Exterior lighting power allowance. The exterior lighting power allowance (watts) is calculated as follows:

1. Determine the Lighting Zone (LZ) for the building according to Table C405.5.2(1), unless otherwise specified by the code official.
2. For each exterior area that is to be illuminated by lighting that is powered through the energy service for the building, determine the applicable area type from Table C405.5.2(2). For area types not listed, select the area type that most closely represents the proposed use of the area.
3. Determine the total area or length of each area type and multiply by the value for the area type in Table C405.5.2(2) to determine the lighting power (watts) allowed for each area type.
4. The total exterior lighting power allowance (watts) is the sum of the base site allowance determined according to Table C405.5.2(2), plus the watts from each area type.

TABLE C405.5.2(1)
EXTERIOR LIGHTING ZONES

LIGHTING ZONE	DESCRIPTION
1	Developed areas of national parks, state parks, forest land, and rural areas
2	Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed-use areas
3	All other areas not classified as lighting zone 1, 2 or 4
4	High-activity commercial districts in major metropolitan areas as designated by the local land use planning authority

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TABLE C405.5.2(2)
LIGHTING POWER ALLOWANCES FOR BUILDING EXTERIORS

	LIGHTING ZONES			
	Zone 1	Zone 2	Zone 3	Zone 4
Base Site Allowance	350 W	400 W	500 W	900 W
Uncovered Parking Areas				
Parking areas and drives	0.03 W/ft^2	0.04 W/ft^2	0.06 W/ft^2	0.08 W/ft^2
Building Grounds				
Walkways and ramps less than 10 feet wide	0.50 W/linear foot	0.50 W/linear foot	0.60 W/linear foot	0.70 W/linear foot
Walkways and ramps 10 feet wide or greater, plaza areas, special feature areas	0.10 W/ft^2	0.10 W/ft^2	0.11 W/ft^2	0.14 W/ft^2
Dining areas	0.65 W/ft^2	0.65 W/ft^2	0.75 W/ft^2	0.95 W/ft^2
Stairways	0.60 W/ft^2	0.70 W/ft^2	0.70 W/ft^2	0.70 W/ft^2
Pedestrian tunnels	0.12 W/ft^2	0.12 W/ft^2	0.14 W/ft^2	0.21 W/ft^2
Landscaping	0.03 W/ft^2	0.04 W/ft^2	0.04 W/ft^2	0.04 W/ft^2
Building Entrances and Exits				
Pedestrian and vehicular entrances and exits	14 W/linear foot of opening	14 W/linear foot of opening	21 W/linear foot of opening	21 W/linear foot of opening
Entry canopies	0.20 W/ft^2	0.25 W/ft^2	0.40 W/ft^2	0.40 W/ft^2
Loading docks	0.35 W/ft^2	0.35 W/ft^2	0.35 W/ft^2	0.35 W/ft^2
Sales Canopies				
Free-standing and attached	0.40 W/ft^2	0.40 W/ft^2	0.60 W/ft^2	0.70 W/ft^2
Outdoor Sales				
Open areas (including vehicle sales lots)	0.20 W/ft^2	0.20 W/ft^2	0.35 W/ft^2	0.50 W/ft^2
Street frontage for vehicle sales lots in addition to “open area” allowance	No allowance	7 W/linear foot	7 W/linear foot	21 W/linear foot

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m^2.
W = watts.

TABLE C405.5.2(3)
INDIVIDUAL LIGHTING POWER ALLOWANCES FOR BUILDING EXTERIORS

	LIGHTING ZONES			
	Zone 1	Zone 2	Zone 3	Zone 4
Building facades	No allowance	0.075 W/ft^2 of gross above-grade wall area	0.113 W/ft^2 of gross above-grade wall area	0.15 W/ft^2 of gross above-grade wall area
Automated teller machines (ATM) and night depositories	135 W per location plus 45 W per additional ATM per location			
Uncovered entrances and gate-house inspection stations at guarded facilities	0.50 W/ft^2 of area			
Uncovered loading areas for law enforcement, fire, ambulance and other emergency service vehicles	0.35 W/ft^2 of area			
Drive-up windows and doors	200 W per drive through			
Parking near 24-hour retail entrances.	400 W per main entry			

For SI: For SI: 1 watt per square foot = W/0.0929 m^2.
W = watts.

C405.5.2.1 Additional exterior lighting power. Additional exterior lighting power allowances are available for the specific lighting applications listed in Table C405.5.2(3). These additional power allowances shall be used only for the luminaires serving these specific applications and shall not be used to increase any other lighting power allowance.

C405.5.3 Gas lighting. Gas-fired lighting appliances shall not be equipped with continuously burning pilot ignition systems.

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C405.6 Dwelling electrical meter. Each dwelling unit located in a Group R-2 building shall have a separate electrical meter.

C405.7 Electrical transformers. Low-voltage dry-type distribution electric transformers shall meet the minimum efficiency requirements of Table C405.7 as tested and rated in accordance with the test procedure listed in DOE 10 CFR 431. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the transformer manufacturer.

Exceptions: The following transformers are exempt:

1. Transformers that meet the *Energy Policy Act of 2005* exclusions based on the DOE 10 CFR 431 definition of special purpose applications.
2. Transformers that meet the *Energy Policy Act of 2005* exclusions that are not to be used in general purpose applications based on information provided in DOE 10 CFR 431.
3. Transformers that meet the *Energy Policy Act of 2005* exclusions with multiple voltage taps where the highest tap is not less than 20 percent more than the lowest tap.
4. Drive transformers.
5. Rectifier transformers.
6. Auto-transformers.
7. Uninterruptible power system transformers.
8. Impedance transformers.
9. Regulating transformers.
10. Sealed and nonventilating transformers.
11. Machine tool transformers.
12. Welding transformers.
13. Grounding transformers.
14. Testing transformers.

TABLE C405.7
MINIMUM NOMINAL EFFICIENCY LEVELS FOR DOE 10 CFR 431 LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS

SINGLE-PHASE TRANSFORMERS		THREE-PHASE TRANSFORMERS	
kVA[a]	Efficiency (%)[b]	kVA[a]	Efficiency (%)[b]
15	97.70	15	97.89
25	98.00	30	98.23
37.5	98.20	45	98.40
50	98.30	75	98.60
75	98.50	112.5	98.74
100	98.60	150	98.83
167	98.70	225	98.94
250	98.80	300	99.02
333	98.90	500	99.14
—	—	750	99.23
—	—	1000	99.28

a. kiloVolt-Amp rating.

b. Nominal efficiencies shall be established in accordance with the DOE 10 CFR 431 test procedure for low-voltage dry-type transformers.

C405.8 Electric motors. Electric motors shall meet the minimum efficiency requirements of Tables C405.8(1) through C405.8(4) when tested and rated in accordance with the DOE 10 CFR 431. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the motor manufacturer.

Exception: The standards in this section shall not apply to the following exempt electric motors:

1. Air-over electric motors.
2. Component sets of an electric motor.
3. Liquid-cooled electric motors.
4. Submersible electric motors.
5. Inverter-only electric motors.

C405.9 Vertical and horizontal transportation systems and equipment. Vertical and horizontal transportation systems and equipment shall comply with this section.

C405.9.1 Elevator cabs. For the luminaires in each elevator cab, not including signals and displays, the sum of the lumens divided by the sum of the watts shall be not less than 35 lumens per watt. Ventilation fans in elevators that do not have their own air-conditioning system shall not consume more than 0.33 watts/cfm at the maximum rated speed of the fan. Controls shall be provided that will de-energize ventilation fans and lighting systems when the elevator is stopped, unoccupied and with its doors closed for over 15 minutes.

C405.9.2 Escalators and moving walks. Escalators and moving walks shall comply with ASME A17.1/CSA B44 and shall have automatic controls that reduce speed as permitted in accordance with ASME A17.1/CSA B44 and applicable local code.

Exception: A variable voltage drive system that reduces operating voltage in response to light loading conditions is an alternative to the reduced speed function.

C405.9.2.1 Energy recovery. Escalators shall be designed to recover electrical energy when resisting overspeed in the down direction.

C405.10 Voltage drop. The total *voltage drop* across the combination of customer-owned service conductors, feeder conductors and branch circuit conductors shall not exceed 5 percent.

C405.11 Automatic receptacle control. The following shall have automatic receptacle control complying with Section C405.11.1:

1. At least 50 percent of all 125V, 15- and 20-amp receptacles installed in enclosed offices, conference rooms, rooms used primarily for copy or print functions, breakrooms, classrooms and individual workstations, including those installed in

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modular partitions and module office workstation systems.

2. At least 25 percent of branch circuit feeders installed for modular furniture not shown on the construction documents.

C405.11.1 Automatic receptacle control function. Automatic receptacle controls shall comply with the following:

1. Either split controlled receptacles shall be provided with the top receptacle controlled, or a controlled receptacle shall be located within 12 inches (304.8 mm) of each uncontrolled receptacle.

TABLE C405.8(1)
MINIMUM NOMINAL FULL-LOAD EFFICIENCY FOR NEMA DESIGN A, NEMA DESIGN B, AND IEC DESIGN N MOTORS (EXCLUDING FIRE PUMP) ELECTRIC MOTORS AT 60 HZ[a, b]

MOTOR HORSEPOWER (STANDARD KILOWATT EQUIVALENT)	NOMINAL FULL-LOAD EFFICIENCY (%) AS OF JUNE 1, 2016							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1 (0.75)	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5 (1.1)	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
2 (1.5)	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
3 (2.2)	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5 (3.7)	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5 (5.5)	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10 (7.5)	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15 (11)	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
20 (15)	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
25 (18.5)	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30 (22)	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
40 (30)	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50 (37)	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60 (45)	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75 (55)	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100 (75)	94.1	93.6	95.4	95.4	95.0	95.0	93.6	94.1
125 (90)	95.0	94.1	95.4	95.4	95.0	95.0	94.1	94.1
150 (110)	95.0	94.1	95.8	95.8	95.8	95.4	94.1	94.1
200 (150)	95.4	95.0	96.2	95.8	95.8	95.4	94.5	94.1
250 (186)	95.8	95.0	96.2	95.8	95.8	95.8	95.0	95.0
300 (224)	95.8	95.4	96.2	95.8	95.8	95.8	—	—
350 (261)	95.8	95.4	96.2	95.8	95.8	95.8	—	—
400 (298)	95.8	95.8	96.2	95.8	—	—	—	—
450 (336)	95.8	96.2	96.2	96.2	—	—	—	—
500 (373)	95.8	96.2	96.2	96.2	—	—	—	—

a. Nominal efficiencies shall be established in accordance with DOE 10 CFR 431.

b. For purposes of determining the required minimum nominal full-load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two kilowatt ratings listed in this table, each such motor shall be deemed to have a listed horsepower or kilowatt rating, determined as follows:

1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.
2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.
3. A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula: 1 kilowatt = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with No. 1 or No. 2 above, as applicable.

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TABLE C405.8(2)
MINIMUM NOMINAL FULL-LOAD EFFICIENCY FOR NEMA DESIGN C AND IEC DESIGN H MOTORS AT 60 HZ[a, b]

MOTOR HORSEPOWER (STANDARD KILOWATT EQUIVALENT)	NOMINAL FULL-LOAD EFFICIENCY (%) AS OF JUNE 1, 2016					
	4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open
1 (0.75)	85.5	85.5	82.5	82.5	75.5	75.5
1.5 (1.1)	86.5	86.5	87.5	86.5	78.5	77.0
2 (1.5)	86.5	86.5	88.5	87.5	84.0	86.5
3 (2.2)	89.5	89.5	89.5	88.5	85.5	87.5
5 (3.7)	89.5	89.5	89.5	89.5	86.5	88.5
7.5 (5.5)	91.7	91.0	91.0	90.2	86.5	89.5
10 (7.5)	91.7	91.7	91.0	91.7	89.5	90.2
15 (11)	92.4	93.0	91.7	91.7	89.5	90.2
20 (15)	93.0	93.0	91.7	92.4	90.2	91.0
25 (18.5)	93.6	93.6	93.0	93.0	90.2	91.0
30 (22)	93.6	94.1	93.0	93.6	91.7	91.7
40 (30)	94.1	94.1	94.1	94.1	91.7	91.7
50 (37)	94.5	94.5	94.1	94.1	92.4	92.4
60 (45)	95.0	95.0	94.5	94.5	92.4	93.0
75 (55)	95.4	95.0	94.5	94.5	93.6	94.1
100 (75)	95.4	95.4	95.0	95.0	93.6	94.1
125 (90)	95.4	95.4	95.0	95.0	94.1	94.1
150 (110)	95.8	95.8	95.8	95.4	94.1	94.1
200 (150)	96.2	95.8	95.8	95.4	94.5	94.1

a. Nominal efficiencies shall be established in accordance with DOE 10 CFR 431.

b. For purposes of determining the required minimum nominal full-load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two kilowatt ratings listed in this table, each such motor shall be deemed to have a listed horsepower or kilowatt rating, determined as follows:

1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.
2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.
3. A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula: 1 kilowatt = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with No. 1 or No. 2 above, as applicable.

TABLE C405.8(3)
MINIMUM AVERAGE FULL-LOAD EFFICIENCY POLYPHASE SMALL ELECTRIC MOTORS[a]

MOTOR HORSEPOWER	OPEN MOTORS			
	Number of Poles	2	4	6
	Synchronous Speed (RPM)	3600	1800	1200
0.25	—	65.6	69.5	67.5
0.33	—	69.5	73.4	71.4
0.50	—	73.4	78.2	75.3
0.75	—	76.8	81.1	81.7
1	—	77.0	83.5	82.5
1.5	—	84.0	86.5	83.8
2	—	85.5	86.5	N/A
3	—	85.5	86.9	N/A

N/A = Not Applicable.

a. Average full-load efficiencies shall be established in accordance with DOE 10 CFR 431.

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TABLE C405.8(4)
MINIMUM AVERAGE FULL-LOAD EFFICIENCY FOR CAPACITOR-START CAPACITOR-RUN AND CAPACITOR-START INDUCTION-RUN SMALL ELECTRIC MOTORS[a]

MOTOR HORSEPOWER	OPEN MOTORS			
	Number of Poles	2	4	6
	Synchronous Speed (RPM)	3600	1800	1200
0.25	—	66.6	68.5	62.2
0.33	—	70.5	72.4	66.6
0.50	—	72.4	76.2	76.2
0.75	—	76.2	81.8	80.2
1	—	80.4	82.6	81.1
1.5	—	81.5	83.8	N/A
2	—	82.9	84.5	N/A
3	—	84.1	N/A	N/A

N/A = Not Applicable.

a. Average full-load efficiencies shall be established in accordance with DOE 10 CFR 431.

2. One of the following methods shall be used to provide control:
   2.1. A scheduled basis using a time-of-day operated control device that turns receptacle power off at specific programmed times and can be programmed separately for each day of the week. The control device shall be configured to provide an independent schedule for each portion of the building of not more than 5,000 square feet (464.5 m^2) and not more than one floor. The occupant shall be able to manually override an area for not more than 2 hours. Any individual override switch shall control the receptacles of not more than 5,000 feet (1524 m).
   2.2. An occupant sensor control that shall turn off receptacles within 20 minutes of all occupants leaving a space.
   2.3. An automated signal from another control or alarm system that shall turn off receptacles within 20 minutes after determining that the area is unoccupied.
3. All controlled receptacles shall be permanently marked in accordance with NFPA 70 and be uniformly distributed throughout the space.
4. Plug-in devices shall not comply.

Exceptions: Automatic receptacle controls are not required for the following:

1. Receptacles specifically designated for equipment requiring continuous operation (24 hours per day, 365 days per year).
2. Spaces where an automatic control would endanger the safety or security of the room or building occupants.
3. Within a single modular office workstation, noncontrolled receptacles are permitted to be located more than 12 inches (304.8 mm), but not more than 72 inches (1828 mm) from the controlled receptacles serving that workstation.

C405.12 Energy monitoring. New buildings with a gross *conditioned floor area* of 25,000 square feet (2322 m^2) or larger shall be equipped to measure, monitor, record and report energy consumption data in compliance with Sections C405.12.1 through C405.12.5.

Exception: R-2 occupancies and individual tenant spaces are not required to comply with this section provided that the space has its own utility services and meters and has less than 5,000 square feet (464.5 m^2) of *conditioned floor area*.

C405.12.1 Electrical energy metering. For all electrical energy supplied to the building and its associated site, including but not limited to site lighting, parking, recreational facilities and other areas that serve the building and its occupants, meters or other measurement devices shall be provided to collect energy consumption data for each end-use category required by Section C405.12.2.

C405.12.2 End-use metering categories. Meters or other *approved* measurement devices shall be provided to collect energy use data for each end-use category indicated in Table C405.12.2. Where multiple meters are used to measure any end-use category, the data acquisition system shall total all of the energy used by that category. Not more than 5 percent of the measured load for each of the end-use categories indicated in Table C405.12.2 shall be permitted to be from a load that is not within that category.

Exceptions:

1. HVAC and water heating equipment serving only an individual dwelling unit shall not require end-use metering.
2. End-use metering shall not be required for fire pumps, stairwell pressurization fans or any system that operates only during testing or emergency.
3. End-use metering shall not be required for an individual tenant space having a floor area not greater than 2,500 square feet (232 m^2) where a dedicated source meter complying with Section C405.12.3 is provided.

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TABLE C405.12.2

ENERGY USE CATEGORIES

LOAD CATEGORY	DESCRIPTION OF ENERGY USE
Total HVAC system	Heating, cooling and ventilation, including but not limited to fans, pumps, boilers, chillers and water heating. Energy used by 120-volt equipment, or by 208/120-volt equipment that is located in a building where the main service is 480/277-volt power, is permitted to be excluded from total HVAC system energy use.
Interior lighting	Lighting systems located within the building.
Exterior lighting	Lighting systems located on the building site but not within the building.
Plug loads	Devices, appliances and equipment connected to convenience receptacle outlets.
Process load	Any single load that is not included in an HVAC, lighting or plug load category and that exceeds 5 percent of the peak connected load of the whole building, including but not limited to data centers, manufacturing equipment and commercial kitchens.
Building operations and other miscellaneous loads	The remaining loads not included elsewhere in this table, including but not limited to vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains, ornamental fireplaces, swimming pools, in-ground spas and snow-melt systems.

C405.12.3 Meters. Meters or other measurement devices required by this section shall be configured to automatically communicate energy consumption data to the data acquisition system required by Section C405.12.4. Source meters shall be allowed to be any digital-type meter. Lighting, HVAC or other building systems that can monitor their energy consumption shall be permitted instead of meters. Current sensors shall be permitted, provided that they have a tested accuracy of ±2 percent. Required metering systems and equipment shall have the capability to provide at least hourly data that is fully integrated into the data acquisition system and graphical energy report in accordance with Sections C405.12.4 and C405.12.5.

C405.12.4 Data acquisition system. A data acquisition system shall have the capability to store the data from the required meters and other sensing devices for a minimum of 36 months. The data acquisition system shall have the capability to store real-time energy consumption data and provide hourly, daily, monthly and yearly logged data for each end-use category required by Section C405.12.2.

C405.12.5 Graphical energy report. A permanent and readily accessible reporting mechanism shall be provided in the building that is accessible by building operation and management personnel. The reporting mechanism shall have the capability to graphically provide the energy consumption for each end-use category required by Section C405.12.2 at least every hour, day, month and year for the previous 36 months.

SECTION C406
ADDITIONAL EFFICIENCY REQUIREMENTS

C406.1 Additional energy efficiency credit requirements. New buildings shall achieve a total of 10 credits from Tables C406.1(1) through C406.1(5) where the table is selected based on the use group of the building and from credit calculations as specified in relevant subsections of Section C406. Where a building contains multiple-use groups, credits from each use group shall be weighted by floor area of each group to determine the weighted average building credit. Credits from the tables or calculation shall be achieved where a building complies with one or more of the following:

1. More efficient HVAC performance in accordance with Section C406.2.
2. Reduced lighting power in accordance with Section C406.3.
3. Enhanced lighting controls in accordance with Section C406.4.
4. On-site supply of renewable energy in accordance with Section C406.5.
5. Provision of a dedicated outdoor air system for certain HVAC equipment in accordance with Section C406.6.
6. High-efficiency service water heating in accordance with Section C406.7.
7. Enhanced envelope performance in accordance with Section C406.8.
8. Reduced air infiltration in accordance with Section C406.9
9. Where not required by Section C405.12, include an energy monitoring system in accordance with Section C406.10.
10. Where not required by Section C403.2.3, include a fault detection and diagnostics (FDD) system in accordance with Section C406.11.
11. Efficient kitchen equipment in accordance with Section C406.12.

C406.1.1 Tenant spaces. Tenant spaces shall comply with sufficient options from Tables C406.1(1) through C406.1(5) to achieve a minimum number of 5 credits, where credits are selected from Section C406.2, C406.3, C406.4, C406.6, C406.7 or C406.10. Where the entire building complies using credits from Section C406.5, C406.8 or C406.9, tenant spaces shall be deemed to comply with this section.

Exception: Previously occupied tenant spaces that comply with this code in accordance with Section C501.

C406.2 More efficient HVAC equipment performance. Equipment shall exceed the minimum efficiency requirements listed in the tables in Section C403.3.2. *Variable refrigerant flow systems* listed in the energy efficiency provisions of ANSI/ASHRAE/IES 90.1 in accordance with Section C406.2.1, C406.2.2, C406.2.3 or C406.2.4 shall also meet applicable requirements of Section C403. Energy efficiency credits for heating shall be selected from Section

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C406.2.1 or C406.2.3 and energy efficiency credits for cooling shall be selected from Section C406.2.2, C406.2.4 or C406.2.5. Selected credits shall include a heating or cooling energy efficiency credit or both. Equipment not listed in Tables C403.3.2(1) through C403.3.2(9) and *variable refrigerant flow systems* not listed in the energy efficiency provisions of ANSI/ASHRAE/IES 90.1 shall be limited to 10 percent of the total building system capacity for heating equipment where selecting Section C406.2.1 or C406.2.3 and cooling equipment where selecting Section C406.2.2, C406.2.4 or C406.2.5.

C406.2.1 Five-percent heating efficiency improvement. Equipment shall exceed the minimum heating efficiency requirements by 5 percent.

C406.2.2 Five-percent cooling efficiency improvement. Equipment shall exceed the minimum cooling and heat rejection efficiency requirements by 5 percent. Where multiple cooling performance requirements are provided, the equipment shall exceed the annual energy requirement, including IEER, SEER and IPLV.

C406.2.3 Ten-percent heating efficiency improvement. Equipment shall exceed the minimum heating efficiency requirements by 10 percent.

C406.2.4 Ten-percent cooling efficiency improvement. Equipment shall exceed the minimum cooling and heat rejection efficiency requirements by 10 percent. Where multiple cooling performance requirements are provided, the equipment shall exceed the annual energy requirement, including IEER, SEER and IPLV.

C406.2.5 More than 10-percent cooling efficiency improvement. Where equipment exceeds the minimum annual cooling and heat rejection efficiency requirements by more than 10 percent, energy efficiency credits for cooling may be determined using Equation 4-12, rounded to the nearest whole number. Where multiple cooling performance requirements are provided, the equipment shall exceed the annual energy requirement, including IEER, SEER and IPLV.

$$EEC_{HEC} = EEC_{10}\,[1 + ((CEI - 10\text{ percent}) \div 10\text{ percent})] \quad \textbf{(Equation 4-12)}$$

TABLE C406.1(1)
ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP B OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	1	1	NA	1
C406.2.2: 5% cooling efficiency improvement	6	6	5	5	4	4	3	3	3	2	2	2	1	2	2	2	1
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	1	1	2	2	NA	1
C406.2.4: 10% cooling efficiency improvement	11	12	10	9	7	7	6	5	6	4	4	5	3	4	3	3	3
C406.3: Reduced lighting power	9	8	9	9	9	9	10	8	9	9	7	8	8	6	7	7	6
C406.4: Enhanced digital lighting controls	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1
C406.5: On-site renewable energy	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
C406.6: Dedicated outdoor air	4	4	4	4	4	3	2	5	3	2	5	3	2	7	4	5	3
C406.7.2: Recovered or renewable water heating	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.3: Efficient fossil fuel water heater	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.4: Heat pump water heater	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.8: Enhanced envelope performance	1	4	2	4	4	3	NA	7	4	5	10	7	6	11	10	14	16
C406.9: Reduced air infiltration	2	1	1	2	4	1	NA	8	2	3	11	4	1	15	8	11	6
C406.10: Energy monitoring	4	4	4	4	3	3	3	3	3	3	2	3	2	2	2	2	2
C406.11: Fault detection and diagnostics system	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1

NA = Not Applicable.

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where:

EEC_{HEC} = Energy efficiency credits for cooling efficiency improvement.

EEC_{10} = Section C406.2.4 credits from Tables C406.1(1) through C406.1(5).

CEI = The lesser of: the improvement above minimum cooling and heat rejection efficiency requirements or 15 percent.

C406.3 Reduced lighting power. Buildings shall comply with Section C406.3.1 or C406.3.2, and dwelling units and sleeping units within the building shall comply with Section C406.3.3.

C406.3.1 Reduced lighting power by more than 10 percent. The total connected interior lighting power calculated in accordance with Section C405.3.1 shall be less than 90 percent of the total lighting power allowance calculated in accordance with Section C405.3.2.

C406.3.2 Reduced lighting power by more than 15 percent. Where the total connected interior lighting power calculated in accordance with Section C405.3.1 is less than 85 percent of the total lighting power allowance calculated in accordance with Section C405.3.2, additional energy efficiency credits shall be determined based on Equation 4-13, rounded to the nearest whole number.

$$AEEC_{LPA} = AEEC_{10} \times 10 \times (LPA - LPD) / LPA \quad \textbf{(Equation 4-13)}$$

where:

$AEEC_{LPA}$ = Section C406.3.2 additional energy efficiency credits.

$AEEC_{10}$ = Section C406.3.1 credits from Tables C406.1(1) through C406.1(5).

LPA = Total lighting power allowance calculated in accordance with Section C405.3.2.

LPD = Total connected interior lighting power calculated in accordance with Section C405.3.1.

C406.3.3 Lamp efficacy. Not less than 95 percent of the permanently installed lighting, excluding kitchen appli-

TABLE C406.1(2)
ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP R AND I OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	1	NA	NA	1	NA	1	1	1	1	2	1	2	2
C406.2.2: 5% cooling efficiency improvement	3	3	2	2	1	1	1	1	1	NA	1	1	NA	1	1	1	NA
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	NA	1	NA	NA	1	1	1	2	2	1	3	2	3	4
C406.2.4: 10% cooling efficiency improvement	5	5	4	3	2	3	1	2	2	1	1	1	1	1	1	1	1
C406.3: Reduced lighting power	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
C406.4: Enhanced digital lighting controls	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.5: On-site renewable energy	8	8	8	8	7	8	8	7	7	7	7	7	7	7	7	7	7
C406.6: Dedicated outdoor air system	3	4	3	3	4	2	NA	6	3	4	8	5	5	10	7	11	12
C406.7.2: Recovered or renewable water heating	10	9	11	10	13	12	15	14	14	15	14	14	16	14	15	15	15
C406.7.3: Efficient fossil fuel water heater	5	5	6	6	8	7	8	8	8	9	9	9	10	10	9	10	11
C406.7.4: Heat pump water heater	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
C406.8: Enhanced envelope performance	3	6	3	5	4	4	1	4	3	3	4	5	3	5	4	6	6
C406.9: Reduced air infiltration	6	5	3	11	6	4	NA	7	3	3	9	5	1	13	6	8	3
C406.10: Energy monitoring	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C406.11: Fault detection and diagnostics system	1	1	1	1	1	1	NA	1	1	NA	1	1	NA	1	1	1	1

NA = Not Applicable.

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ance light fixtures, serving dwelling units and sleeping units shall be provided by lamps with an efficacy of not less than 65 lumens per watt or luminaires with an efficacy of not less than 45 lumens per watt.

C406.4 Enhanced digital lighting controls. Interior general lighting in the building shall have the following enhanced lighting controls that shall be located, scheduled and operated in accordance with Sections C405.2.1 through C405.2.3.

1. Luminaires shall be configured for continuous dimming.
2. Luminaires shall be addressed individually. Where individual addressability is not available for the luminaire class type, a controlled group of not more than four luminaries shall be allowed.
3. Not more than eight luminaires shall be controlled together in a *daylight zone*.
4. Fixtures shall be controlled through a digital control system that includes the following function:
   - 4.1. Control reconfiguration based on digital addressability.
   - 4.2. Load shedding.
   - 4.3. Occupancy sensors shall be capable of being reconfigured through the digital control system.
5. Construction documents shall include submittal of a Sequence of Operations, including a specification outlining each of the functions in Item 4.
6. Functional testing of lighting controls shall comply with Section C408.

C406.5 On-site renewable energy. Buildings shall comply with Section C406.5.1 or C406.5.2.

C406.5.1 Basic renewable credit. The total minimum ratings of on-site renewable energy systems, not includ-

TABLE C406.1(3)
ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP E OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	1	1	1	1	1	2	1	2	1	2	2	3	4
C406.2.2: 5% cooling efficiency improvement	4	4	3	3	2	2	2	2	1	1	1	1	NA	1	1	1	NA
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	1	1	1	1	2	3	4	3	4	3	4	3	5	7
C406.2.4: 10% cooling efficiency improvement	7	8	7	6	5	4	3	4	3	1	2	2	1	2	2	2	1
C406.3: Reduced lighting power	8	8	8	9	8	9	9	8	9	9	8	9	8	7	8	7	7
C406.4: Enhanced digital lighting controls	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
C406.5: On-site renewable energy	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5
C406.6: Dedicated outdoor air system	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.2: Recovered or renewable water heating[a]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C406.7.3: Efficient fossil fuel water heater[a]	NA	1	1	1	1	1	1	2	2	3	2	3	2	3	3	3	5
C406.7.4: Heat pump water heater[a]	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	1	1	NA	1	1	1	1
C406.8: Enhanced envelope performance	3	7	3	4	2	4	1	1	3	1	2	3	NA	4	3	6	9
C406.9: Reduced air infiltration	1	1	1	2	NA	NA	NA	NA	NA	NA	1	NA	NA	4	1	4	3
C406.10: Energy monitoring	3	3	3	3	3	3	3	3	3	2	2	3	2	2	2	2	2
C406.11: Fault detection and diagnostics system	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2

NA = Not Applicable.

a. For schools with showers or full-service kitchens.

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ing systems used for credits under Sections C406.7.2, shall be one of the following:

1. Not less than 0.86 Btu/h per square foot (2.7 W/m^2) or 0.25 watts per square foot (2.7 W/m^2) of *conditioned floor area*.
2. Not less than 2 percent of the annual energy used within the building for building mechanical and service water-heating equipment and lighting regulated in Section C405.

C406.5.2 Enhanced renewable credit. Where the total minimum ratings of on-site renewable energy systems exceeds the rating in Section C406.5.1, additional energy efficiency credits shall be determined based on Equation 4-14, rounded to the nearest whole number.

$$AEEC_{RRa} = AEEC_{2.5} \times RRa/RR_1 \quad \textbf{(Equation 4-14)}$$

where:

$AEEC_{RRa}$ = Section C406.5.2 additional energy efficiency credits.

$AEEC_{2.5}$ = Section C406.5 credits from Tables C406.1(1) through C406.1(5).

RRa = Actual total minimum ratings of *on-site renewable energy* systems (in Btu/h, watts per square foot or W/m^2).

RR_1 = Minimum ratings of *on-site renewable energy* systems required by Section C406.5.1 (in Btu/h, watts per square foot or W/m^2).

C406.6 Dedicated outdoor air system. Buildings containing equipment or systems regulated by Section C403.3.4, C403.4.3, C403.4.4, C403.4.5, C403.6, C403.8.4, C403.8.6, C403.8.6.1, C403.10.1, C403.10.2, C403.10.3 or C403.10.4 shall be equipped with an independent ventilation system designed to provide not less than the minimum 100-percent outdoor air to each individual occupied space, as specified by the *International Mechanical Code*. The ventilation system shall be capable of total energy recovery. The HVAC system shall include supply-air temperature controls that automatically reset the supply-air temperature in response to representative building loads or to outdoor air temperatures. The controls shall reset the supply-air temperature not less

TABLE C406.1(4)
ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP M OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	1	1	NA	1	1	2	2	2	2	3	2	3	4
C406.2.2: 5% cooling efficiency improvement	5	6	4	4	3	3	1	2	2	1	1	2	NA	1	1	1	NA
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	1	1	1	1	2	2	4	3	4	5	5	3	6	8
C406.2.4: 10% cooling efficiency improvement	9	12	9	8	6	6	3	4	4	1	2	3	NA	2	2	2	1
C406.3: Reduced lighting power	13	13	15	14	16	14	17	15	15	14	12	14	14	16	16	14	12
C406.4: Enhanced digital lighting controls	3	3	4	3	4	3	4	4	4	3	3	3	3	4	4	3	3
C406.5: On-site renewable energy	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	6
C406.6: Dedicated outdoor air system	3	4	3	3	3	3	1	3	2	2	2	3	2	4	3	4	4
C406.7.2: Recovered or renewable water heating	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.3: Efficient fossil fuel water heater	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.4: Heat pump water heater	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.8: Enhanced envelope performance	4	6	3	4	3	3	1	6	4	4	4	5	4	6	5	8	9
C406.9: Reduced air infiltration	1	1	1	2	1	1	NA	3	1	1	3	2	1	7	3	6	3
C406.10: Energy monitoring	4	5	5	5	5	4	4	4	4	3	3	4	3	4	4	4	3
C406.11: Fault detection and diagnostics system	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2

NA = Not Applicable.

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than 25 percent of the difference between the design supply-air temperature and the design room-air temperature.

C406.7 Reduced energy use in service water heating. Buildings shall comply with Section C406.7.1 and Section C406.7.2, C406.7.3 or C406.7.4.

C406.7.1 Building type. To qualify for this credit, the building shall contain one of the following use groups, and the additional energy efficiency credit shall be prorated by conditioned floor area of the portion of the building comprised of the following use groups:

1. Group R-1: Boarding houses, hotels or motels.
2. Group I-2: Hospitals, psychiatric hospitals and nursing homes.
3. Group A-2: Restaurants and banquet halls or buildings containing food preparation areas.
4. Group F: Laundries.
5. Group R-2.
6. Group A-3: Health clubs and spas.
7. Group E: Schools with full-service kitchens or locker rooms with showers.
8. Buildings showing a service hot water load of 10 percent or more of total building energy loads, as shown with an energy analysis as described in Section C407.

C406.7.2 Recovered or renewable water heating. The building service water-heating system shall have one or more of the following that are sized to provide not less than 30 percent of the building's annual hot water requirements, or sized to provide 70 percent of the building's annual hot water requirements if the building is required to comply with Section C403.10.5:

1. Waste heat recovery from service hot water, heat-recovery chillers, building equipment or process equipment.
2. *On-site renewable energy* water-heating systems.

TABLE C406.1(5)
ADDITIONAL ENERGY EFFICIENCY CREDITS FOR OTHER[a] OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	1	1	1	1	1	2	1	2	1	2	2	3	3
C406.2.2: 5% cooling efficiency improvement	5	5	4	4	3	3	2	2	2	1	1	2	1	1	1	1	1
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	1	1	1	1	2	2	3	3	3	3	4	3	5	5
C406.2.4: 10% cooling efficiency improvement	8	9	8	7	5	5	3	4	4	2	2	3	2	2	2	2	2
C406.3: Reduced lighting power	8	8	9	9	9	9	10	8	9	9	7	8	8	8	8	8	7
C406.4: Enhanced digital lighting controls	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	1
C406.5: On-site renewable energy	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7
C406.6: Dedicated outdoor air system	3	4	3	3	4	3	2	5	3	3	5	4	3	7	5	7	6
C406.7.2: Recovered or renewable water heating[b]	10	9	11	10	13	12	15	14	14	15	14	14	16	14	15	15	15
C406.7.3: Efficient fossil fuel water heater[b]	5	5	6	6	8	7	8	8	8	9	9	9	10	10	9	10	11
C406.7.4: Heat pump water heater[b]	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
C406.8: Enhanced envelope performance	3	6	3	4	3	4	1	5	4	3	5	5	4	7	6	9	10
C406.9: Reduced air infiltration	3	2	2	4	4	2	NA	6	2	2	6	4	1	10	5	7	4
C406.10: Energy monitoring	3	3	3	3	3	3	3	3	3	3	2	3	2	2	2	3	2
C406.11: Fault detection and diagnostics system	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1

NA = Not Applicable.

a. Other occupancy groups include all groups except Groups B, E, I, M and R.

b. For occupancy groups listed in Section C406.7.1.

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C406.7.3 Efficient fossil fuel water heater. The combined input-capacity weighted-average equipment rating of all fossil fuel water-heating equipment in the building shall be not less than 95 percent Et or 0.95 EF. This option shall receive only half the listed credits for buildings required to comply with Section C404.2.1.

C406.7.4 Heat pump water heater. Where electric resistance water heaters are allowed, all service hot water system heating requirements shall be met using heat pump technology with a combined input-capacity weighted-average EF of 3.0. Air-source heat pump water heaters shall not draw conditioned air from within the building, except exhaust air that would otherwise be exhausted to the exterior.

C406.8 Enhanced envelope performance. The total UA of the *building thermal envelope* as designed shall be not less than 15 percent below the total UA of the *building thermal envelope* in accordance with Section C402.1.5.

C406.9 Reduced air infiltration. Air infiltration shall be verified by whole-building pressurization testing conducted in accordance with ASTM E779 or ASTM E1827 by an independent third party. The measured air-leakage rate of the building envelope shall not exceed 0.25 cfm/ft^2 (2.0 L/s × m^2) under a pressure differential of 0.3 inches water column (75 Pa), with the calculated surface area being the sum of the above- and below-grade building envelope. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner.

Exception: For buildings having over 250,000 square feet (25 000 m^2) of *conditioned floor area*, air leakage testing need not be conducted on the whole building where testing is conducted on representative above-grade sections of the building. Tested areas shall total not less than 25 percent of the conditioned floor area and shall be tested in accordance with this section.

C406.10 Energy monitoring. Buildings shall be equipped to measure, monitor, record and report energy consumption data in compliance with Sections C406.10.1 through C406.10.5.

C406.10.1 Electrical energy metering. For all electrical energy supplied to the building and its associated site, including but not limited to site lighting, parking, recreational facilities, and other areas that serve the building and its occupants, meters or other measurement devices shall be provided to collect energy consumption data for each end-use category required by Section C406.10.2.

C406.10.2 End-use metering categories. Meters or other *approved* measurement devices shall be provided to collect energy use data for each end-use category listed in Table 406.10.2. These meters shall have the capability to collect energy consumption data for the whole building or for each separately metered portion of the building. Where multiple meters are used to measure any end-use category, the data acquisition system shall total all of the energy used by that category. Not more than 5 percent of the measured load for each of the end-use categories listed in Table 406.10.2 is permitted to be from a load not within the category.

Exceptions:

1. HVAC and water-heating equipment serving only an individual dwelling unit does not require end-use metering.
2. End-use metering is not required for fire pumps, stairwell pressurization fans or any system that operates only during testing or emergency.

TABLE C406.10.2
ENERGY USE CATEGORIES

LOAD CATEGORY	DESCRIPTION OF ENERGY USE
Total HVAC system	Heating, cooling and ventilation, including but not limited to fans, pumps, boilers, chillers and water heating. Energy used by 120-volt equipment, or by 208/120-volt equipment that is located in a building where the main service is 480/277-volt power, is permitted to be excluded from total HVAC system energy use.
Interior lighting	Lighting systems located within the building.
Exterior lighting	Lighting systems located on the building site but not within the building.
Plug loads	Devices, appliances and equipment connected to convenience receptacle outlets.
Process loads	Any single load that is not included in an HVAC, lighting or plug load category and that exceeds 5 percent of the peak connected load of the whole building, including but not limited to data centers, manufacturing equipment and commercial kitchens.
Building operations and other miscellaneous loads	The remaining loads not included elsewhere in this table, including but not limited to vertical transportation systems and automatic doors.

C406.10.3 Meters. Meters or other measurement devices required by this section shall be configured to automatically communicate energy consumption data to the data acquisition system required by Section C406.10.4. Source meters shall be allowed to be any digital-type meter. Lighting, HVAC or other building systems that can monitor their energy consumption shall be permitted instead of meters. Current sensors shall be permitted, provided that they have a tested accuracy of ±2 percent. Required metering systems and equipment shall have the capability to provide at least hourly data that is fully integrated into the data acquisition system and graphical energy report in accordance with Sections C406.10.4 and C406.10.5.

C406.10.4 Data acquisition system. A data acquisition system shall have the capability to store the data from the required meters and other sensing devices for a minimum of 36 months. The data acquisition system shall have the capability to store real-time energy consumption data and provide hourly, daily, monthly and yearly logged data for each end-use category required by Section C406.10.2.

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C406.10.5 Graphical energy report. A permanent and readily accessible reporting mechanism shall be provided in the building that is accessible by building operation and management personnel. The reporting mechanism shall have the capability to graphically provide the energy consumption for each end-use category required by Section C406.10.2 at least every hour, day, month and year for the previous 36 months.

C406.11 Fault detection and diagnostics system. A fault detection and diagnostics system shall be installed to monitor the HVAC system's performance and automatically identify faults. The system shall do all of the following:

1. Include permanently installed sensors and devices to monitor the HVAC system's performance.
2. Sample the HVAC system's performance at least once every 15 minutes.
3. Automatically identify and report HVAC system faults.
4. Automatically notify authorized personnel of identified HVAC system faults.
5. Automatically provide prioritized recommendations for repair of identified faults based on analysis of data collected from the sampling of the HVAC system performance.
6. Be capable of transmitting the prioritized fault repair recommendations to remotely located authorized personnel.

C406.12 Efficient kitchen equipment. For buildings and spaces designated as Group A-2 or facilities that include a commercial kitchen with at least one gas or electric fryer, all fryers, dishwashers, steam cookers and ovens shall comply with all of the following:

1. Achieve performance levels in accordance with the equipment specifications listed in Tables C406.12(1) through C406.12(4) when rated in accordance with the applicable test procedure.
2. Be installed prior to the issuance of the Certificate of Occupancy.
3. Have associated performance levels listed on the construction documents submitted for permitting.

Energy efficiency credits for efficient kitchen equipment shall be independent of climate zone and determined based on Equation 4-15, rounded to the nearest whole number.

$$AEEC_K = 20 \times Area_K / Area_B \quad \textbf{(Equation 4-15)}$$

where:

$AEEC_K$ = Section C406.12 additional energy efficiency credits.

$Area_K$ = Floor area of full-service kitchen (ft² or m²).

$Area_B$ = Gross floor area of building (ft² or m²).

TABLE C406.12(1)
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL FRYERS

FRYER TYPE	HEAVY-LOAD COOKING ENERGY EFFICIENCY	IDLE ENERGY RATE	TEST PROCEDURE
Standard open deep-fat gas fryers	≥ 50%	≤ 9,000 Btu/h	ASTM F1361
Standard open deep-fat electric fryers	≥ 83%	≤ 800 watts	
Large-vat open deep-fat gas fryers	≥ 50%	≤ 12,000 Btu/h	ASTM F2144
Large-vat open deep-fat electric fryers	≥ 80%	≤ 1,100 watts	

For SI: 1 Btu/h = 0.293/W.

TABLE C406.12(2)
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL STEAM COOKERS

FUEL TYPE	PAN CAPACITY	COOKING ENERGY EFFICIENCY[a]	IDLE ENERGY RATE	TEST PROCEDURE
Electric steam	3-pan	50%	400 watts	ASTM F1484
	4-pan	50%	530 watts	
	5-pan	50%	670 watts	
	6-pan and larger	50%	800 watts	
Gas steam	3-pan	38%	6,250 Btu/h	
	4-pan	38%	8,350 Btu/h	
	5-pan	38%	10,400 Btu/h	
	6-pan and larger	38%	12,500 Btu/h	

For SI: Btu/h = 0.293/W.

a. Cooking energy efficiency is based on heavy load (potato) cooking capacity.

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TABLE C406.12(3)
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL DISHWASHERS

MACHINE TYPE	HIGH-TEMPERATURE EFFICIENCY REQUIREMENTS		LOW-TEMPERATURE EFFICIENCY REQUIREMENTS		TEST PROCEDURE
	Idle energy rate[a]	Water consumption[b]	Idle energy rate[a]	Water consumption[b]	
Under counter	≤ .50 kW	≤ 0.86 GPR	≤ 0.50 kW	≤ 1.19 GPR	ASTM F1696 ASTM F1920
Stationary single-tank door	≤ .70 kW	≤ 0.89 GPR	≤ 0.60 kW	≤ 1.18 GPR	
Pot, pan and utensil	≤ 1.20 kW	≤ 0.58 GPR	≤ 1.00 kW	≤ 0.58 GPSF	
Single-tank conveyor	≤ 1.50 kW	≤ 0.70 GPR	≤ 1.50 kW	≤ 0.79 GPR	
Multiple-tank conveyor	≤ 2.25 kW	≤ 0.54 GPR	≤ 2.00 kW	≤ 0.54 GPR	
Single-tank flight	Reported	GPH ≤ 2.975x + 55.00	Reported	GPH ≤ 2.975x + 55.00	
Multiple-tank flight	Reported	GPH ≤ 4.96x + 17.00	Reported	GPH ≤ 4.96x + 17.00	

a. Idle results shall be measured with the door closed and represent the total idle energy consumed by the machine, including all tank heaters and controls. Booster heater (internal or external) energy consumption shall not be part of this measurement unless it cannot be separately monitored.
b. GPR = gallons per rack, GPSF = gallons per square foot of rack, GPH = gallons per hour, x = maximum conveyor belt speed (feet/minute) × conveyor belt width (feet).

TABLE C406.12(4)
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL OVENS

FUEL TYPE	CLASSIFICATION	IDLE RATE	COOKING-ENERGY EFFICIENCY, %	TEST PROCEDURE
Convection ovens				
Gas	Full-size	≤ 12,000 Btu/h	≥ 46	ASTM F1496
Electric	Half-size	≤ 1.0 Btu/h	≥ 71	
	Full-size	≤ 1.60 Btu/h		
Combination ovens				
Gas	Steam mode	≤ 200P^a + 6,511 Btu/h	≥ 41	ASTM F2861
	Convection mode	≤ 150P^a + 5,425 Btu/h	≥ 56	
Electric	Steam mode	≤ 0.133P^a + 0.6400 kW	≥ 55	
	Convection mode	≤ 0.080P^a + 0.4989 kW	≥ 76	
Rack ovens				
Gas	Single	≤ 25,000 Btu/h	≥ 48	ASTM F2093
	Double	≤ 30,000 Btu/h	≥ 52	

For SI: 1 Btu/h = 0.293/W.
a. P = Pan Capacity: the number of steam table pans the combination oven is able to accommodate in accordance with ASTM F1495.

SECTION C407
TOTAL BUILDING PERFORMANCE

C407.1 Scope. This section establishes criteria for compliance using total building performance. The following systems and loads shall be included in determining the total building performance: heating systems, cooling systems, service water heating, fan systems, lighting power, receptacle loads and process loads.

Exception: Energy used to recharge or refuel vehicles that are used for on-road and off-site transportation purposes.

C407.2 Mandatory requirements. Compliance based on total building performance requires that a proposed design meet all of the following:

1. The requirements of the sections indicated within Table C407.2.
2. An annual energy cost that is less than or equal to 80 percent of the annual energy cost of the *standard reference design*. Energy prices shall be taken from a source *approved* by the *code official*, such as the Department of Energy, Energy Information Administration's *State Energy Data System Prices and*

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Expenditures reports. *Code officials* shall be permitted to require time-of-use pricing in energy cost calculations. The reduction in energy cost of the proposed design associated with *on-site renewable energy* shall be not more than 5 percent of the total energy cost. The amount of renewable energy purchased from off-site sources shall be the same in the *standard reference design* and the *proposed design*.

Exception: Jurisdictions that require site energy (1 kWh = 3413 Btu) rather than energy cost as the metric of comparison.

TABLE C407.2
REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION[a]	TITLE
Envelope	
C402.5	Air leakage—thermal envelope
Mechanical	
C403.1.1	Calculation of heating and cooling loads
C403.1.2	Data centers
C403.2	System design
C403.3	Heating and cooling equipment efficiencies
C403.4, except C403.4.3, C403.4.4 and C403.4.5	Heating and cooling system controls
C403.5.5	Economizer fault detection and diagnostics
C403.7, except C403.7.4.1	Ventilation and exhaust systems
C403.8, except C403.8.6	Fan and fan controls
C403.9	Large-diameter ceiling fans
C403.11, except C403.11.3	Refrigeration equipment performance
C403.12	Construction of HVAC system elements
C403.13	Mechanical systems located outside of the building thermal envelope
C404	Service water heating
C405, except C405.3	Electrical power and lighting systems
C408	Maintenance information and system commisioning

a. Reference to a code section includes all the relative subsections except as indicated in the table.

C407.3 Documentation. Documentation verifying that the methods and accuracy of compliance software tools conform to the provisions of this section shall be provided to the *code official.*

C407.3.1 Compliance report. Permit submittals shall include a report documenting that the proposed design has annual energy costs less than or equal to the annual energy costs of the standard reference design. The compliance documentation shall include the following information:

1. Address of the building.
2. An inspection checklist documenting the building component characteristics of the *proposed design* as specified in Table C407.4.1(1). The inspection checklist shall show the estimated annual energy cost for both the *standard reference design* and the *proposed design*.
3. Name of individual completing the compliance report.
4. Name and version of the compliance software tool.

C407.3.2 Additional documentation. The *code official* shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the *standard reference design*.
2. Thermal zoning diagrams consisting of floor plans showing the thermal zoning scheme for *standard reference design* and *proposed design*.
3. Input and output reports from the energy analysis simulation program containing the complete input and output files, as applicable. The output file shall include energy use totals and energy use by energy source and end-use served, total hours that space conditioning loads are not met and any errors or warning messages generated by the simulation tool as applicable.
4. An explanation of any error or warning messages appearing in the simulation tool output.
5. A certification signed by the builder providing the building component characteristics of the *proposed design* as given in Table C407.4.1(1).
6. Documentation of the reduction in energy use associated with *on-site renewable energy*.

C407.4 Calculation procedure. Except as specified by this section, the *standard reference design* and *proposed design* shall be configured and analyzed using identical methods and techniques.

C407.4.1 Building specifications. The *standard reference design* and *proposed design* shall be configured and analyzed as specified by Table C407.4.1(1). Table C407.4.1(1) shall include by reference all notes contained in Table C402.1.4.

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TABLE C407.4.1(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT CHARACTERISTICS	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Space use classification	Same as proposed	The space use classification shall be chosen in accordance with Table C405.3.2(1) or C405.3.2(2) for all areas of the building covered by this permit. Where the space use classification for a building is not known, the building shall be categorized as an office building.
Roofs	Type: insulation entirely above deck	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table C402.1.4	As proposed
	Solar absorptance: 0.75	As proposed
	Emittance: 0.90	As proposed
Walls, above-grade	Type: same as proposed	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table C402.1.4	As proposed
	Solar absorptance: 0.75	As proposed
	Emittance: 0.90	As proposed
Walls, below-grade	Type: mass wall	As proposed
	Gross area: same as proposed	As proposed
	U-Factor: as specified in Table C402.1.4 with insulation layer on interior side of walls	As proposed
Floors, above-grade	Type: joist/framed floor	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table C402.1.4	As proposed
Floors, slab-on-grade	Type: unheated	As proposed
	F-factor: as specified in Table C402.1.4	As proposed
Opaque doors	Type: swinging	As proposed
	Area: Same as proposed	As proposed
	U-factor: as specified in Table C402.1.4	As proposed
Vertical fenestration other than opaque doors	Area 1. The proposed vertical fenestration area; where the proposed vertical fenestration area is less than 40 percent of above-grade wall area. 2. 40 percent of above-grade wall area; where the proposed vertical fenestration area is 40 percent or more of the above-grade wall area.	As proposed
	U-factor: as specified in Table C402.4	As proposed
	SHGC: as specified in Table C402.4 except that for climates with no requirement (NR) SHGC = 0.40 shall be used	As proposed
	External shading and PF: none	As proposed

(continued)

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TABLE C407.4.1(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT CHARACTERISTICS	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Skylights	Area 1. The proposed skylight area; where the proposed skylight area is less than that permitted by Section C402.1. 2. The area permitted by Section C402.1; where the proposed skylight area exceeds that permitted by Section C402.1.	As proposed
	U-factor: as specified in Table C402.4	As proposed
	SHGC: as specified in Table C402.4 except that for climates with no requirement (NR) SHGC = 0.40 shall be used.	As proposed
Lighting, interior	The interior lighting power shall be determined in accordance with Section C405.3.2. Where the occupancy of the building is not known, the lighting power density shall be 1.0 watt per square foot based on the categorization of buildings with unknown space classification as offices.	As proposed
Lighting, exterior	The lighting power shall be determined in accordance with Tables C405.5.2(1), C405.5.2(2) and C405.5.2(3). Areas and dimensions of surfaces shall be the same as proposed.	As proposed
Internal gains	Same as proposed	Receptacle, motor and process loads shall be modeled and estimated based on the space use classification. End-use load components within and associated with the building shall be modeled to include, but not be limited to, the following: exhaust fans, parking garage ventilation fans, exterior building lighting, swimming pool heaters and pumps, elevators, escalators, refrigeration equipment and cooking equipment.
Schedules	Same as proposed **Exception:** Thermostat settings and schedules for HVAC systems that utilize radiant heating, radiant cooling and elevated air speed, provided that equivalent levels of occupant thermal comfort are demonstrated by means of equal Standard Effective Temperature as calculated in Normative Appendix B of ASHRAE Standard 55.	Operating schedules shall include hourly profiles for daily operation and shall account for variations between weekdays, weekends, holidays and any seasonal operation. Schedules shall model the time-dependent variations in occupancy, illumination, receptacle loads, thermostat settings, mechanical ventilation, HVAC equipment availability, service hot water usage and any process loads. The schedules shall be typical of the proposed building type as determined by the designer and approved by the jurisdiction.
Mechanical ventilation	Same as proposed	As proposed, in accordance with Section C403.2.2.
Heating systems	Fuel type: same as proposed design	As proposed
	Equipment type[a]: as specified in Tables C407.4.1(2) and C407.4.1(3)	As proposed
	Efficiency: as specified in the tables in Section C403.3.2.	As proposed
	Capacity[b]: sized proportionally to the capacities in the proposed design based on sizing runs, and shall be established such that no smaller number of unmet heating load hours and no larger heating capacity safety factors are provided than in the proposed design.	As proposed

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TABLE C407.4.1(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT CHARACTERISTICS	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Cooling systems	Fuel type: same as proposed design	As proposed
	Equipment type[c]: as specified in Tables C407.4.1(2) and C407.4.1(3)	As proposed
	Efficiency: as specified in Tables C403.3.2(1), C403.3.2(2) and C403.3.2(3)	As proposed
	Capacity[b]: sized proportionally to the capacities in the proposed design based on sizing runs, and shall be established such that no smaller number of unmet cooling load hours and no larger cooling capacity safety factors are provided than in the proposed design.	As proposed
	Economizer[d]: same as proposed, in accordance with Section C403.5.	As proposed
Service water heating[e]	Fuel type: same as proposed	As proposed
	Efficiency: as specified in Table C404.2	For Group R, as proposed multiplied by SWHF. For other than Group R, as proposed multiplied by efficiency as provided by the manufacturer of the DWHR unit.
	Capacity: same as proposed	As proposed
	Where no service water hot water system exists or is specified in the proposed design, no service hot water heating shall be modeled.	

For SI: 1 watt per square foot = 10.7 w/m^2.

SWHF = Service Water Heat Recovery factor, DWHR = Drain Water Heat Recovery.

a. Where no heating system exists or has been specified, the heating system shall be modeled as fossil fuel. The system characteristics shall be identical in both the standard reference design and proposed design.

b. The ratio between the capacities used in the annual simulations and the capacities determined by sizing runs shall be the same for both the standard reference design and proposed design.

c. Where no cooling system exists or no cooling system has been specified, the cooling system shall be modeled as an air-cooled single-zone system, one unit per thermal zone. The system characteristics shall be identical in both the standard reference design and proposed design.

d. If an economizer is required in accordance with Table C403.5(1) and where no economizer exists or is specified in the proposed design, then a supply-air economizer shall be provided in the standard reference design in accordance with Section C403.5.

e. The SWHF shall be applied as follows:
   1. Where potable water from the DWHR unit supplies not less than one shower and not greater than two showers, of which the drain water from the same showers flows through the DWHR unit then SWHF = [1 – (DWHR unit efficiency × 0.36)].
   2. Where potable water from the DWHR unit supplies not less than three showers and not greater than four showers, of which the drain water from the same showers flows through the DWHR unit then SWHF = [1 – (DWHR unit efficiency × 0.33)].
   3. Where potable water from the DWHR unit supplies not less than five showers and not greater than six showers, of which the drain water from the same showers flows through the DWHR unit, then SWHF = [1 – (DWHR unit efficiency × 0.26)].
   4. Where Items 1 through 3 are not met, SWHF = 1.0.

C407.4.2 Thermal blocks. The *standard reference design* and *proposed design* shall be analyzed using identical thermal blocks as specified in Section C407.4.2.1, C407.4.2.2 or C407.4.2.3.

C407.4.2.1 HVAC zones designed. Where HVAC *zones* are defined on HVAC design drawings, each HVAC *zone* shall be modeled as a separate thermal block.

Exception: Different HVAC *zones* shall be allowed to be combined to create a single thermal block or identical thermal blocks to which multipliers are applied, provided that:

1. The space use classification is the same throughout the thermal block.
2. All HVAC *zones* in the thermal block that are adjacent to glazed exterior walls face the same orientation or their orientations are within 45 degrees (0.79 rad) of each other.
3. All of the *zones* are served by the same HVAC system or by the same kind of HVAC system.

C407.4.2.2 HVAC zones not designed. Where HVAC *zones* have not yet been designed, thermal blocks shall be defined based on similar internal load densities, occupancy, lighting, thermal and temperature schedules, and in combination with the following guidelines:

1. Separate thermal blocks shall be assumed for interior and perimeter spaces. Interior spaces shall be those located more than 15 feet (4572 mm) from an exterior wall. Perimeter spaces

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TABLE C407.4.1(2)
HVAC SYSTEMS MAP

CONDENSER COOLING SOURCE[a]	HEATING SYSTEM CLASSIFICATION[b]	STANDARD REFERENCE DESIGN HVC SYSTEM TYPE[c]		
		Single-zone Residential System	Single-zone Nonresidential System	All Other
Water/ground	Electric resistance	System 5	System 5	System 1
	Heat pump	System 6	System 6	System 6
	Fossil fuel	System 7	System 7	System 2
Air/none	Electric resistance	System 8	System 9	System 3
	Heat pump	System 8	System 9	System 3
	Fossil fuel	System 10	System 11	System 4

a. Select "water/ground" where the proposed design system condenser is water or evaporatively cooled; select "air/none" where the condenser is air cooled. Closed-circuit dry coolers shall be considered to be air cooled. Systems utilizing district cooling shall be treated as if the condenser water type were "water." Where mechanical cooling is not specified or the mechanical cooling system in the proposed design does not require heat rejection, the system shall be treated as if the condenser water type were "Air." For proposed designs with ground-source or groundwater-source heat pumps, the standard reference design HVAC system shall be water-source heat pump (System 6).

b. Select the path that corresponds to the proposed design heat source: electric resistance, heat pump (including air source and water source), or fuel fired. Systems utilizing district heating (steam or hot water) and systems without heating capability shall be treated as if the heating system type were "fossil fuel." For systems with mixed fuel heating sources, the system or systems that use the secondary heating source type (the one with the smallest total installed output capacity for the spaces served by the system) shall be modeled identically in the standard reference design and the primary heating source type shall be used to determine standard reference design HVAC system type.

c. Select the standard reference design HVAC system category: The system under "single-zone residential system" shall be selected where the HVAC system in the proposed design is a single-zone system and serves a Group R occupancy. The system under "single-zone nonresidential system" shall be selected where the HVAC system in the proposed design is a single-zone system and serves other than Group R occupancy. The system under "all other" shall be selected for all other cases.

shall be those located closer than 15 feet (4572 mm) from an *exterior wall*.

2. Separate thermal blocks shall be assumed for spaces adjacent to glazed exterior walls: a separate *zone* shall be provided for each orientation, except orientations that differ by not more than 45 degrees (0.79 rad) shall be permitted to be considered to be the same orientation. Each *zone* shall include floor area that is 15 feet (4572 mm) or less from a glazed perimeter wall, except that floor area within 15 feet (4572 mm) of glazed perimeter walls having more than one orientation shall be divided proportionately between *zones*.
3. Separate thermal blocks shall be assumed for spaces having floors that are in contact with the ground or exposed to ambient conditions from *zones* that do not share these features.
4. Separate thermal blocks shall be assumed for spaces having exterior ceiling or roof assemblies from *zones* that do not share these features.

C407.4.2.3 Group R-2 occupancy buildings. Group R-2 occupancy spaces shall be modeled using one thermal block per space except that those facing the same orientations are permitted to be combined into one thermal block. Corner units and units with roof or floor loads shall only be combined with units sharing these features.

C407.5 Calculation software tools. Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the *standard reference design* and the *proposed design* and shall include the following capabilities.

1. Building operation for a full calendar year (8,760 hours).
2. Climate data for a full calendar year (8,760 hours) and shall reflect *approved* coincident hourly data for temperature, solar radiation, humidity and wind speed for the building location.
3. Ten or more thermal zones.
4. Thermal mass effects.
5. Hourly variations in occupancy, illumination, receptacle loads, thermostat settings, mechanical ventilation, HVAC equipment availability, service hot water usage and any process loads.
6. Part-load performance curves for mechanical equipment.
7. Capacity and efficiency correction curves for mechanical heating and cooling equipment.
8. Printed *code official* inspection checklist listing each of the *proposed design* component characteristics from Table C407.4.1(1) determined by the analysis to provide compliance, along with their respective performance ratings, including but not limited to *R*-value, *U*-factor, SHGC, HSPF, AFUE, SEER and EF.

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TABLE C407.4.1(3)
SPECIFICATIONS FOR THE STANDARD REFERENCE DESIGN HVAC SYSTEM DESCRIPTIONS

SYSTEM NO.	SYSTEM TYPE	FAN CONTROL	COOLING TYPE	HEATING TYPE
1	Variable air volume with parallel fan-powered boxes[a]	VAV[d]	Chilled water[e]	Electric resistance
2	Variable air volume with reheat[b]	VAV[d]	Chilled water[e]	Hot water fossil fuel boiler[f]
3	Packaged variable air volume with parallel fan-powered boxes[a]	VAV[d]	Direct expansion[c]	Electric resistance
4	Packaged variable air volume with reheat[b]	VAV[d]	Direct expansion[c]	Hot water fossil fuel boiler[f]
5	Two-pipe fan coil	Constant volume[i]	Chilled water[e]	Electric resistance
6	Water-source heat pump	Constant volume[i]	Direct expansion[c]	Electric heat pump and boiler[g]
7	Four-pipe fan coil	Constant volume[i]	Chilled water[e]	Hot water fossil fuel boiler[f]
8	Packaged terminal heat pump	Constant volume[i]	Direct expansion[c]	Electric heat pump[h]
9	Packaged rooftop heat pump	Constant volume[i]	Direct expansion[c]	Electric heat pump[h]
10	Packaged terminal air conditioner	Constant volume[i]	Direct expansion	Hot water fossil fuel boiler[f]
11	Packaged rooftop air conditioner	Constant volume[i]	Direct expansion	Fossil fuel furnace

For SI: 1 foot = 304.8 mm, 1 cfm = 0.4719 L/s, 1 Btu/h = 0.293/W, °C = [(°F) – 32]/1.8.

a. **VAV with parallel boxes:** Fans in parallel VAV fan-powered boxes shall be sized for 50 percent of the peak design flow rate and shall be modeled with 0.35 W/cfm fan power. Minimum volume setpoints for fan-powered boxes shall be equal to the minimum rate for the space required for ventilation consistent with Section C403.6.1, Item 3. Supply air temperature setpoint shall be constant at the design condition.

b. **VAV with reheat:** Minimum volume setpoints for VAV reheat boxes shall be 0.4 cfm/ft^2 of floor area. Supply air temperature shall be reset based on zone demand from the design temperature difference to a 10°F temperature difference under minimum load conditions. Design airflow rates shall be sized for the reset supply air temperature; i.e., a 10°F temperature difference.

c. **Direct expansion:** The fuel type for the cooling system shall match that of the cooling system in the proposed design.

d. **VAV:** Where the proposed design system has a supply, return or relief fan motor 25 hp or larger, the corresponding fan in the VAV system of the standard reference design shall be modeled assuming a variable-speed drive. For smaller fans, a forward-curved centrifugal fan with inlet vanes shall be modeled. Where the proposed design's system has a direct digital control system at the zone level, static pressure setpoint reset based on zone requirements in accordance with Section C403.8.6 shall be modeled.

e. **Chilled water:** For systems using purchased chilled water, the chillers are not explicitly modeled and chilled water costs shall be based as determined in Sections C407.2 and C407.4.2. Otherwise, the standard reference design's chiller plant shall be modeled with chillers having the number as indicated in Table C407.4.1(4) as a function of standard reference building chiller plant load and type as indicated in Table C407.4.1(5) as a function of individual chiller load. Where chiller fuel source is mixed, the system in the standard reference design shall have chillers with the same fuel types and with capacities having the same proportional capacity as the proposed design's chillers for each fuel type. Chilled water supply temperature shall be modeled at 44°F design supply temperature and 56°F return temperature. Piping losses shall not be modeled in either building model. Chilled water supply water temperature shall be reset in accordance with Section C403.4.4. Pump system power for each pumping system shall be the same as the proposed design; where the proposed design has no chilled water pumps, the standard reference design pump power shall be 22 W/gpm (equal to a pump operating against a 75-foot head, 65-percent combined impeller and motor efficiency). The chilled water system shall be modeled as primary-only variable flow with flow maintained at the design rate through each chiller using a bypass. Chilled water pumps shall be modeled as riding the pump curve or with variable-speed drives where required in Section C403.4.4. The heat rejection device shall be an axial fan cooling tower with two-speed fans where required in Section C403.10. Condenser water design supply temperature shall be 85°F or 10°F approach to design wet-bulb temperature, whichever is lower, with a design temperature rise of 10°F. The tower shall be controlled to maintain a 70°F leaving water temperature where weather permits, floating up to leaving water temperature at design conditions. Pump system power for each pumping system shall be the same as the proposed design; where the proposed design has no condenser water pumps, the standard reference design pump power shall be 19 W/gpm (equal to a pump operating against a 60-foot head, 60-percent combined impeller and motor efficiency). Each chiller shall be modeled with separate condenser water and chilled water pumps interlocked to operate with the associated chiller.

f. **Fossil fuel boiler:** For systems using purchased hot water or steam, the boilers are not explicitly modeled and hot water or steam costs shall be based on actual utility rates. Otherwise, the boiler plant shall use the same fuel as the proposed design and shall be natural draft. The standard reference design boiler plant shall be modeled with a single boiler where the standard reference design plant load is 600,000 Btu/h and less and with two equally sized boilers for plant capacities exceeding 600,000 Btu/h. Boilers shall be staged as required by the load. Hot water supply temperature shall be modeled at 180°F design supply temperature and 130°F return temperature. Piping losses shall not be modeled in either building model. Hot water supply water temperature shall be reset in accordance with Section C403.4.4. Pump system power for each pumping system shall be the same as the proposed design; where the proposed design has no hot water pumps, the standard reference design pump power shall be 19 W/gpm (equal to a pump operating against a 60-foot head, 60-percent combined impeller and motor efficiency). The hot water system shall be modeled as primary only with continuous variable flow. Hot water pumps shall be modeled as riding the pump curve or with variable speed drives where required by Section C403.4.4.

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TABLE C407.4.1(3)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE DESIGN HVAC SYSTEM DESCRIPTIONS

g. **Electric heat pump and boiler:** Water-source heat pumps shall be connected to a common heat pump water loop controlled to maintain temperatures between 60°F and 90°F. Heat rejection from the loop shall be provided by an axial fan closed-circuit evaporative fluid cooler with two-speed fans where required in Section C403.8.6. Heat addition to the loop shall be provided by a boiler that uses the same fuel as the proposed design and shall be natural draft. Where no boilers exist in the proposed design, the standard reference building boilers shall be fossil fuel. The standard reference design boiler plant shall be modeled with a single boiler where the standard reference design plant load is 600,000 Btu/h or less and with two equally sized boilers for plant capacities exceeding 600,000 Btu/h. Boilers shall be staged as required by the load. Piping losses shall not be modeled in either building model. Pump system power shall be the same as the proposed design; where the proposed design has no pumps, the standard reference design pump power shall be 22 W/gpm, which is equal to a pump operating against a 75-foot head, with a 65-percent combined impeller and motor efficiency. Loop flow shall be variable with flow shutoff at each heat pump when its compressor cycles off as required by Section C403.4.4. Loop pumps shall be modeled as riding the pump curve or with variable speed drives where required by Section C403.10.

h. **Electric heat pump:** Electric air-source heat pumps shall be modeled with electric auxiliary heat. The system shall be controlled with a multistage space thermostat and an outdoor air thermostat wired to energize auxiliary heat only on the last thermostat stage and when outdoor air temperature is less than 40°F.

i. **Constant volume:** Fans shall be controlled in the same manner as in the proposed design; i.e., fan operation whenever the space is occupied or fan operation cycled on calls for heating and cooling. Where the fan is modeled as cycling and the fan energy is included in the energy efficiency rating of the equipment, fan energy shall not be modeled explicitly.

TABLE C407.5.1(4)
NUMBER OF CHILLERS

TOTAL CHILLER PLANT CAPACITY	NUMBER OF CHILLERS
≤ 300 tons	1
> 300 tons, < 600 tons	2, sized equally
≥ 600 tons	2 minimum, with chillers added so that all are sized equally and none is larger than 800 tons

For SI: 1 ton = 3517 W.

TABLE C407.5.1(5)
WATER CHILLER TYPES

INDIVIDUAL CHILLER PLANT CAPACITY	ELECTRIC CHILLER TYPE	FOSSIL FUEL CHILLER TYPE
≤ 100 tons	Reciprocating	Single-effect absorption, direct fired
> 100 tons, < 300 tons	Screw	Double-effect absorption, direct fired
≥ 300 tons	Centrifugal	Double-effect absorption, direct fired

For SI: 1 ton = 3517 W.

C407.5.1 Specific approval. Performance analysis tools complying with the applicable subsections of Section C407 and tested according to ASHRAE Standard 140 shall be permitted to be *approved.* Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall be permitted to approve tools for a specified application or limited scope.

C407.5.2 Input values. Where calculations require input values not specified by Sections C402, C403, C404 and C405, those input values shall be taken from an *approved* source.

C407.5.3 Exceptional calculation methods. Where the simulation program does not model a design, material or device of the *proposed design*, an exceptional calculation method shall be used where approved by the *code official*. Where there are multiple designs, materials or devices that the simulation program does not model, each shall be calculated separately and exceptional savings determined for each. The total exceptional savings shall not constitute more than half of the difference between the baseline building performance and the proposed building performance. Applications for approval of an exceptional method shall include all of the following:

1. Step-by-step documentation of the exceptional calculation method performed, detailed enough to reproduce the results.
2. Copies of all spreadsheets used to perform the calculations.
3. A sensitivity analysis of energy consumption where each of the input parameters is varied from half to double the value assumed.
4. The calculations shall be performed on a time step basis consistent with the simulation program used.
5. The performance rating calculated with and without the exceptional calculation method.

SECTION C408
MAINTENANCE INFORMATION AND SYSTEM COMMISSIONING

C408.1 General. This section covers the provision of maintenance information and the commissioning of, and the functional testing requirements for, building systems.

C408.1.1 Building operations and maintenance information. The building operations and maintenance documents shall be provided to the owner and shall consist of manufacturers' information, specifications and recommendations; programming procedures and data points; narratives; and other means of illustrating to the owner how the building, equipment and systems are intended to be installed, maintained and operated. Required regular maintenance actions for equipment and systems shall be clearly stated on a readily visible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.

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C408.2 Mechanical systems and service water-heating systems commissioning and completion requirements. Prior to the final mechanical and plumbing inspections, the *registered design professional or approved agency* shall provide evidence of mechanical systems *commissioning* and completion in accordance with the provisions of this section.

Construction document notes shall clearly indicate provisions for *commissioning* and completion requirements in accordance with this section and are permitted to refer to specifications for further requirements. Copies of all documentation shall be given to the owner or owner's authorized agent and made available to the *code official* upon request in accordance with Sections C408.2.4 and C408.2.5.

Exceptions: The following systems are exempt:

1. Mechanical systems and service water-heating systems in buildings where the total mechanical equipment capacity is less than 480,000 Btu/h (140.7 kW) cooling capacity and 600,000 Btu/h (175.8 kW) combined service water-heating and space-heating capacity.
2. Systems included in Section C403.5 that serve individual *dwelling units* and *sleeping units*.

C408.2.1 Commissioning plan. A *commissioning plan* shall be developed by a *registered design professional* or *approved agency* and shall include the following items:

1. A narrative description of the activities that will be accomplished during each phase of *commissioning,* including the personnel intended to accomplish each of the activities.
2. A listing of the specific equipment, appliances or systems to be tested and a description of the tests to be performed.
3. Functions to be tested including, but not limited to, calibrations and economizer controls.
4. Conditions under which the test will be performed. Testing shall affirm winter and summer design conditions and full outside air conditions.
5. Measurable criteria for performance.

C408.2.2 Systems adjusting and balancing. HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within the tolerances provided in the product specifications. Test and balance activities shall include air system and hydronic system balancing.

C408.2.2.1 Air systems balancing. Each supply air outlet and *zone* terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the *International Mechanical Code*. Discharge dampers used for air-system balancing are prohibited on constant-volume fans and variable volume fans with motors 10 hp (18.6 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp (0.746 kW), fan speed shall be adjusted to meet design flow conditions.

Exception: Fans with fan motors of 1 hp (0.74 kW) or less are not required to be provided with a means for air balancing.

C408.2.2.2 Hydronic systems balancing. Individual hydronic heating and cooling coils shall be equipped with means for balancing and measuring flow. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the capability to measure pressure across the pump, or test ports at each side of each pump.

Exception: The following equipment is not required to be equipped with a means for balancing or measuring flow:

1. Pumps with pump motors of 5 hp (3.7 kW) or less.
2. Where throttling results in not greater than 5 percent of the nameplate horsepower draw above that required if the impeller were trimmed.

C408.2.3 Functional performance testing. Functional performance testing specified in Sections C408.2.3.1 through C408.2.3.3 shall be conducted.

C408.2.3.1 Equipment. Equipment functional performance testing shall demonstrate the installation and operation of components, systems and system-to-system interfacing relationships in accordance with approved plans and specifications such that operation, function and maintenance serviceability for each of the commissioned systems are confirmed. Testing shall include all modes and *sequence of operation*, including under full-load, part-load and the following emergency conditions:

1. All modes as described in the *sequence* of *operation*.
2. Redundant or *automatic* back-up mode.
3. Performance of alarms.
4. Mode of operation upon a loss of power and restoration of power.

Exception: Unitary or packaged HVAC equipment listed in the tables in Section C403.3.2 that do not require supply air economizers.

C408.2.3.2 Controls. HVAC and service water-heating control systems shall be tested to document that control devices, components, equipment and systems are calibrated and adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with *approved* plans and specifications.

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C408.2.3.3 Economizers. Air economizers shall undergo a functional test to determine that they operate in accordance with manufacturer's specifications.

C408.2.4 Preliminary commissioning report. A preliminary report of *commissioning* test procedures and results shall be completed and certified by the *registered design professional* or *approved agency* and provided to the building owner or owner's authorized agent. The report shall be organized with mechanical and service hot water findings in separate sections to allow independent review. The report shall be identified as "Preliminary Commissioning Report," shall include the completed Commissioning Compliance Checklist, Figure C408.2.4, and shall identify:

1. Itemization of deficiencies found during testing required by this section that have not been corrected at the time of report preparation.
2. Deferred tests that cannot be performed at the time of report preparation because of climatic conditions.
3. Climatic conditions required for performance of the deferred tests.
4. Results of functional performance tests.
5. Functional performance test procedures used during the commissioning process, including measurable criteria for test acceptance.

C408.2.4.1 Acceptance of report. Buildings, or portions thereof, shall not be considered as acceptable for a final inspection pursuant to Section C105.2.6 until the *code official* has received the Preliminary Commissioning Report from the building owner or owner's authorized agent.

Project Information: _____ Project Name:_____

Project Address: _____

Commissioning Authority: _____

Commissioning Plan (Section C408.2.1)

☐ Commissioning Plan was used during construction and includes all items required by Section C408.2.1

☐ Systems Adjusting and Balancing has been completed.

☐ HVAC Equipment Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ HVAC Controls Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Economizer Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Lighting Controls Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Service Water Heating System Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Manual, record documents and training have been completed or scheduled

☐ Preliminary Commissioning Report submitted to owner and includes all items required by Section C408.2.4

I hereby certify that the commissioning provider has provided me with evidence of mechanical, service water heating and lighting systems commissioning in accordance with the 2021 IECC.

Signature of Building Owner or Owner's Representative _____ Date_____

FIGURE C408.2.4
COMMISSIONING COMPLIANCE CHECKLIST

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C408.2.4.2 Copy of report. The *code official* shall be permitted to require that a copy of the Preliminary Commissioning Report be made available for review by the *code official*.

C408.2.5 Documentation requirements. The *construction documents* shall specify that the documents described in this section be provided to the building owner or owner's authorized agent within 90 days of the date of receipt of the *certificate of occupancy*.

C408.2.5.1 System balancing report. A written report describing the activities and measurements completed in accordance with Section C408.2.2.

C408.2.5.2 Final commissioning report. A report of test procedures and results identified as "Final Commissioning Report" shall be delivered to the building owner or owner's authorized agent. The report shall be organized with mechanical system and service hot water system findings in separate sections to allow independent review. The report shall include the following:

1. Results of functional performance tests.
2. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.
3. Functional performance test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

Exception: Deferred tests that cannot be performed at the time of report preparation due to climatic conditions.

C408.3 Functional testing of lighting controls. Automatic lighting controls required by this code shall comply with this section.

C408.3.1 Functional testing. Prior to passing final inspection, the *registered design professional* or *approved agency* shall provide evidence that the lighting control systems have been tested to ensure that control hardware and software are calibrated, adjusted, programmed and in proper working condition in accordance with the *construction documents* and manufacturer's instructions. Functional testing shall be in accordance with Sections C408.3.1.1 through C408.3.1.3 for the applicable control type.

C408.3.1.1 Occupant sensor controls. Where *occupant sensor controls* are provided, the following procedures shall be performed:

1. Certify that the *occupant sensor* has been located and aimed in accordance with manufacturer recommendations.
2. For projects with seven or fewer *occupant sensors*, each sensor shall be tested.
3. For projects with more than seven *occupant sensors,* testing shall be done for each unique combination of sensor type and space geometry. Where multiples of each unique combination of sensor type and space geometry are provided, not less than 10 percent and in no case fewer than one, of each combination shall be tested unless the *code official* or design professional requires a higher percentage to be tested. Where 30 percent or more of the tested controls fail, all remaining identical combinations shall be tested.

   For *occupant sensor controls* to be tested, verify the following:

   3.1. Where *occupant sensor controls* include status indicators, verify correct operation.

   3.2. The controlled lights turn off or down to the permitted level within the required time.

   3.3. For auto-on *occupant sensor controls*, the lights turn on to the permitted level when an occupant enters the space.

   3.4. For manual-on *occupant sensor controls*, the lights turn on only when manually activated.

   3.5. The lights are not incorrectly turned on by movement in adjacent areas or by HVAC operation.

C408.3.1.2 Time-switch controls. Where *time-switch controls* are provided, the following procedures shall be performed:

1. Confirm that the *time-switch control* is programmed with accurate weekday, weekend and holiday schedules.
2. Provide documentation to the owner of *time-switch controls* programming including weekday, weekend, holiday schedules, and set-up and preference program settings.
3. Verify the correct time and date in the time switch.
4. Verify that any battery back-up is installed and energized.
5. Verify that the override time limit is set to not more than 2 hours.
6. Simulate occupied condition. Verify and document the following:

   6.1. All lights can be turned on and off by their respective area control switch.

   6.2. The switch only operates lighting in the enclosed space in which the switch is located.

7. Simulate unoccupied condition. Verify and document the following:

   7.1. Nonexempt lighting turns off.

   7.2. Manual override switch allows only the lights in the enclosed space where the override switch is located to turn on or

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remain on until the next scheduled shut-off occurs.

8. Additional testing as specified by the *registered design professional.*

C408.3.1.3 Daylight responsive controls. Where *daylight responsive controls* are provided, the following shall be verified:

1. Control devices have been properly located, field calibrated and set for accurate setpoints and threshold light levels.
2. Daylight controlled lighting loads adjust to light level setpoints in response to available daylight.
3. The calibration adjustment equipment is located for *ready access* only by authorized personnel.

C408.3.2 Documentation requirements. The *construction documents* shall specify that the documents described in this section be provided to the building owner or owner's authorized agent within 90 days of the date of receipt of the *certificate of occupancy*.

C408.3.2.1 Drawings. Construction documents shall include the location and catalogue number of each piece of equipment.

C408.3.2.2 Manuals. An operating and maintenance manual shall be provided and include the following:

1. Name and address of not less than one service agency for installed equipment.
2. A narrative of how each system is intended to operate, including recommended setpoints.
3. Submittal data indicating all selected options for each piece of lighting equipment and lighting controls.
4. Operation and maintenance manuals for each piece of lighting equipment. Required routine maintenance actions, cleaning and recommended relamping shall be clearly identified.
5. A schedule for inspecting and recalibrating all lighting controls.

C408.3.2.3 Report. A report of test results shall be provided and include the following:

1. Results of functional performance tests.
2. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.

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CHAPTER 5 [CE]
EXISTING BUILDINGS

User note:

About this chapter: *Many buildings are renovated or altered in numerous ways that could affect the energy use of the building as a whole. Chapter 5 requires the application of certain parts of Chapter 4 in order to maintain, if not improve, the conservation of energy by the renovated or altered building.*

SECTION C501
GENERAL

C501.1 Scope. The provisions of this chapter shall control the *alteration*, *repair*, *addition* and *change of occupancy* of existing buildings and structures.

C501.1.1 Existing buildings. Except as specified in this chapter, this code shall not be used to require the removal, *alteration* or abandonment of, nor prevent the continued use and maintenance of, an existing *building* or *building* system lawfully in existence at the time of adoption of this code.

** **C501.2 Compliance.** *Additions*, *alterations*, *repairs*, and changes of occupancy to, or relocation of, existing *buildings* and structures shall comply with Sections C502, C503, C504 and C505 of this code, as applicable, and with the provisions for *alterations*, *repairs*, *additions* and changes of occupancy or relocation, respectively, in the *International Building Code*, *International Existing Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Property Maintenance Code, International Private Sewage Disposal Code* and NFPA 70. Changes where unconditioned space is changed to conditioned space shall comply with Section C502.

Exception: *Additions*, *alterations*, *repairs* or changes of occupancy complying with ANSI/ASHRAE/IESNA 90.1.

C501.3 Maintenance. *Buildings* and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices and systems required by this code shall be maintained in conformance to the code edition under which they were installed. The owner or the owner's authorized agent shall be responsible for the maintenance of buildings and structures. The requirements of this chapter shall not provide the basis for removal or abrogation of energy conservation, fire protection and safety systems and devices in existing structures.

* **C501.4 New and replacement materials.** Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for *repairs*, provided that hazards to life, health or property are not created. Hazardous materials shall not be used where the code for new construction would not allow use of these materials in buildings of similar occupancy, purpose and location.

C501.5 Historic buildings. Provisions of this code relating to the construction, *repair, alteration*, restoration and movement of structures, and *change of occupancy* shall not be mandatory for *historic buildings* provided that a report has been submitted to the *code official* and signed by a *registered design professional*, or a representative of the State Historic Preservation Office or the historic preservation authority having jurisdiction, demonstrating that compliance with that provision would threaten, degrade or destroy the historic form, fabric or function of the *building*.

SECTION C502
ADDITIONS

C502.1 General. *Additions* to an existing *building*, *building* system or portion thereof shall conform to the provisions of this code as those provisions relate to new construction without requiring the unaltered portion of the existing *building* or *building* system to comply with this code. *Additions* shall not create an unsafe or hazardous condition or overload existing building systems. An *addition* shall be deemed to comply with this code if the *addition* alone complies or if the existing building and *addition* comply with this code as a single building.

C502.2 Change in space conditioning. Any nonconditioned or low-energy space that is altered to become *conditioned space* shall be required to comply with Section C502.

Exceptions:

1. Where the component performance alternative in Section C402.1.5 is used to comply with this section, the proposed UA shall be not greater than 110 percent of the target UA.
2. Where the total building performance option in Section C407 is used to comply with this section, the annual energy cost of the proposed design shall be not greater than 110 percent of the annual energy cost otherwise permitted by Section C407.2.

C502.3 Compliance. *Additions* shall comply with Sections C502.3.1 through C502.3.6.2.

C502.3.1 Vertical fenestration area. Additions shall comply with the following:

1. Where an addition has a new vertical fenestration area that results in a total building fenestration area less than or equal to that permitted by Section

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C402.4.1, the addition shall comply with Section C402.1.5, C402.4.3 or C407.

2. Where an addition with vertical fenestration that results in a total building fenestration area greater than Section C402.4.1 or an addition that exceeds the fenestration area greater than that permitted by Section C402.4.1, the fenestration shall comply with Section C402.4.1.1 for the addition only.
3. Where an addition has vertical fenestration that results in a total building vertical fenestration area exceeding that permitted by Section C402.4.1.1, the addition shall comply with Section C402.1.5 or C407.

C502.3.2 Skylight area. Skylights shall comply with the following:

1. Where an addition has new skylight area that results in a total building fenestration area less than or equal to that permitted by Section C402.4.1, the addition shall comply with Section C402.1.5 or C407.
2. Where an addition has new skylight area that results in a total building skylight area greater than permitted by Section C402.4.1 or where additions have skylight area greater than that permitted by Section C402.4.1, the skylight area shall comply with Section C402.4.1.2 for the addition only.
3. Where an addition has skylight area that results in a total building skylight area exceeding that permitted by Section C402.4.1.2, the addition shall comply with Section C402.1.5 or C407.

C502.3.3 Building mechanical systems. New mechanical systems and equipment that are part of the *addition* and serve the building heating, cooling and ventilation needs shall comply with Sections C403 and C408.

C502.3.4 Service water-heating systems. New service water-heating equipment, controls and service water-heating piping shall comply with Section C404.

C502.3.5 Pools and inground permanently installed spas. New pools and inground permanently installed spas shall comply with Section C404.9.

C502.3.6 Lighting power and systems. New lighting systems that are installed as part of the addition shall comply with Sections C405 and C408.

C502.3.6.1 Interior lighting power. The total interior lighting power for the *addition* shall comply with Section C405.3.2 for the *addition* alone, or the existing building and the *addition* shall comply as a single building.

C502.3.6.2 Exterior lighting power. The total exterior lighting power for the *addition* shall comply with Section C405.5.2 for the *addition* alone, or the existing building and the *addition* shall comply as a single building.

SECTION C503
ALTERATIONS

C503.1 General. *Alterations* to any *building* or structure shall comply with the requirements of Section C503. *Alterations* shall be such that the existing *building* or structure is not less conforming to the provisions of this code than the existing *building* or structure was prior to the *alteration*. *Alterations* to an existing *building*, *building* system or portion thereof shall conform to the provisions of this code as those provisions relate to new construction without requiring the unaltered portions of the existing *building* or *building* system to comply with this code. *Alterations* shall not create an unsafe or hazardous condition or overload existing *building* systems.

Exception: The following *alterations* need not comply with the requirements for new construction, provided that the energy use of the building is not increased:

1. Storm windows installed over existing *fenestration*.
2. Surface-applied window film installed on existing single-pane *fenestration* assemblies reducing solar heat gain, provided that the code does not require the glazing or *fenestration* to be replaced.
3. Existing ceiling, wall or floor cavities exposed during construction, provided that these cavities are filled with insulation.
4. Construction where the existing roof, wall or floor cavity is not exposed.
5. *Roof recover*.
6. *Air barriers* shall not be required for *roof recover* and roof replacement where the *alterations* or renovations to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.

C503.2 Building envelope. New building envelope assemblies that are part of the *alteration* shall comply with Sections C402.1 through C402.5.

Exception: Where the existing building exceeds the fenestration area limitations of Section C402.4.1 prior to alteration, the building is exempt from Section C402.4.1 provided that there is not an increase in fenestration area.

C503.2.1 Roof replacement. *Roof replacements* shall comply with Section C402.1.3, C402.1.4, C402.1.5 or C407 where the existing roof assembly is part of the *building thermal envelope* and contains insulation entirely above the roof deck. In no case shall the *R*-value of the roof insulation be reduced or the *U*-factor of the roof assembly be increased as part of the *roof replacement*.

C503.2.2 Vertical fenestration. The addition of *vertical fenestration* that results in a total building *fenestration* area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.1.5, C402.4.3 or C407. The addition of *vertical fenestration* that results in a total building *fenestration* area greater than Section C402.4.1 shall comply with Section C402.4.1.1 for the

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space adjacent to the new fenestration only. *Alterations* that result in a total building *vertical fenestration* area exceeding that specified in Section C402.4.1.1 shall comply with Section C402.1.5 or C407. Provided that the vertical fenestration area is not changed, using the same vertical fenestration area in the *standard reference design* as the building prior to alteration shall be an alternative to using the vertical fenestration area specified in Table C407.4.1(1).

** **C503.2.2.1 Application to replacement fenestration products.** Where some or all of an existing *fenestration* unit is replaced with a new *fenestration* product, including sash and glazing, the replacement *fenestration* unit shall meet the applicable requirements for *U*-factor and *SHGC* in Table C402.4.

Exception: An area-weighted average of the *U*-factor of replacement fenestration products being installed in the building for each fenestration product category listed in Table C402.4 shall be permitted to satisfy the *U*-factor requirements for each fenestration product category listed in Table C402.4. Individual fenestration products from different product categories listed in Table C402.4 shall not be combined in calculating the area-weighted average *U*-factor.

C503.2.3 Skylight area. New *skylight* area that results in a total building *skylight* area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.1.5, C402.4 or C407. The addition of *skylight* area that results in a total building skylight area greater than Section C402.4.1 shall comply with Section C402.4.1.2 for the space adjacent to the new skylights. *Alterations* that result in a total building skylight area exceeding that specified in Section C402.4.1.2 shall comply with Section C402.1.5 or C407. Provided that the skylight area is not changed, using the same skylight area in the *standard reference design* as the building prior to alteration shall be an alternative to using the skylight area specified in Table C407.4.1(1).

C503.3 Heating and cooling systems. New heating, cooling and duct systems that are part of the *alteration* shall comply with Sections C403 and C408.

C503.3.1 Economizers. New cooling systems that are part of *alteration* shall comply with Section C403.5.

C503.4 Service hot water systems. New service hot water systems that are part of the *alteration* shall comply with Sections C404 and C408.

C503.5 Lighting systems. New lighting systems that are part of the *alteration* shall comply with Sections C405 and C408.

Exception: *Alterations* that replace less than 10 percent of the luminaires in a space, provided that such *alterations* do not increase the installed interior lighting power.

SECTION C504
REPAIRS

C504.1 General. *Buildings* and structures, and parts thereof, shall be repaired in compliance with Section C501.3 and this section. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered to be part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section C501.3, ordinary *repairs* exempt from *permit* and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.

Where a building was constructed to comply with ANSI/ASHRAE/IESNA 90.1, repairs shall comply with the standard and need not comply with Sections C402, C403, C404 and C405.

C504.2 Application. For the purposes of this code, the following shall be considered to be repairs:

1. Glass-only replacements in an existing sash and frame.
2. *Roof repairs*.
3. Air barriers shall not be required for *roof repair* where the repairs to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.
4. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided that an existing vestibule that separates a conditioned space from the exterior shall not be removed.
5. *Repairs* where only the bulb, the ballast or both within the existing luminaires in a space are replaced, provided that the replacement does not increase the installed interior lighting power.

SECTION C505
CHANGE OF OCCUPANCY OR USE

C505.1 General. Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code. Where the use in a space changes from one use in Table C405.3.2(1) or C405.3.2(2) to another use in Table C405.3.2(1) or C405.3.2(2), the installed lighting wattage shall comply with Section C405.3. Where the space undergoing a change in occupancy or use is in a building with a fenestration area that exceeds the limitations of Section C402.4.1, the space is exempt from Section C402.4.1 provided that there is not an increase in fenestration area.

Exceptions:

1. Where the component performance alternative in Section C402.1.5 is used to comply with this section, the proposed UA shall not be greater than 110 percent of the target UA.

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2. Where the total building performance option in Section C407 is used to comply with this section, the annual energy cost of the proposed design shall not be greater than 110 percent of the annual energy cost otherwise permitted by Section C407.3.

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CHAPTER 6 [CE]
REFERENCED STANDARDS

User note:

About this chapter: *Chapter 6 lists the full title, edition year and address of the promulgator for all standards that are referenced in the code. The section numbers in which the standards are referenced are also listed.*

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section 108.

AAMA

American Architectural Manufacturers Association
1827 Walden Office Square
Suite 550
Schaumburg, IL 60173-4268

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors, and Skylights
Table C402.5.5

AHAM

Association of Home Appliance Manufacturers
1111 19th Street NW, Suite 402
Washington, DC 20036

ANSI/AHAM RAC-1—2015: Room Air Conditioners
Table C403.3.2(4)

AHRI

Air-Conditioning, Heating, & Refrigeration Institute
2111 Wilson Blvd, Suite 500
Arlington, VA22201

210/240—2017 and 2023: Performance Rating of Unitary Air-conditioning and Air-source Heat Pump Equipment
Table C403.3.2(1), Table C403.3.2(2)

310/380—2017 (CSA-C744-17): Packaged Terminal Air Conditioners and Heat Pumps
Table C403.3.2(4)

340/360—2019: Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment
Table C403.3.2(1), Table C403.3.2(2)

365(I-P)—2009: Commercial and Industrial Unitary Air-conditioning Condensing Units
Table C403.3.2(1)

390 (I-P)—2003: Performance Rating of Single Package Vertical Air-conditioners and Heat Pumps
Table C403.3.2(3)

400 (I-P)—2015: Performance Rating of Liquid to Liquid Heat Exchangers
C403.3.2

440—2008: Performance Rating of Room Fan Coils—with Addendum 1
C403.12.3

460—2005: Performance Rating of Remote Mechanical-draft Air-cooled Refrigerant Condensers
Table C403.3.2(7)

550/590 (I-P)—2018: Performance Rating of Water-chilling and Heat Pump Water-heating Packages Using the Vapor Compression Cycle
Table C403.3.2(3), Table C403.3.2(15)

560—2018: Absorption Water Chilling and Water Heating Packages
Table C403.3.2(3)

910—2014: Performance Rating of Indoor Pool Dehumidifiers
Table C403.3.2(11)

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AHRI—continued

920—2015: Performance Rating of DX-Dedicated Outdoor Air System Units
Table C403.3.2(12) , Table C403.3.2(13)

1160 (I-P) —2014: Performance Rating of Heat Pump Pool Heaters (with Addendum 1)
Table C404.2

1200 (I-P)—2013: Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets
Table C403.11.1

1230—2014: Performance Rating of Variable Refrigerant Flow (VRF) Multi-split Air-Conditioning and Heat Pump Equipment (with Addendum 1)
Table C403.3.2(9)

1250 (I-P)—2014: Standard for Performance Rating in Walk-in Coolers and Freezers
Table C403.11.2.1(3)

1360—2017: Performance Rating of Computer and Data Processing Room Air Conditioners
Table C403.3.2(10) , Table C403.3.2(16)

ISO/AHRI/ASHRAE 13256-1 (2012): Water-to-Air and Brine-to-Air Heat Pumps—Testing and Rating for Performance
Table C403.3.2(14)

AMCA

Air Movement and Control Association International
30 West University Drive
Arlington Heights, IL 60004-1806

208—18: Calculation of the Fan Energy Index
C403.8.3

220—19: Laboratory Methods of Testing Air Curtain Units for Aerodynamic Performance Rating
C402.5.9

230—15: Laboratory Methods of Testing Air Circulating Fans for Rating and Certification
C403.9

500D—18: Laboratory Methods for Testing Dampers for Rating
C403.7.7

ANSI

American National Standards Institute
25 West 43rd Street, 4th Floor
New York, NY 10036

Z21.10.3/CSA 4.3—17: Gas Water Heaters, Volume III—Storage Water Heaters with Input Ratings Above 75,000 Btu per Hour, Circulating Tank and Instantaneous
Table C404.2

ANSI Z21.47—2016/CSA 2.3—2016: Gas-Fired Central Furnaces
Table C403.3.2(4)

ANSI Z83.8—2016/CSA 2.6—2016: Gas Unit Heater, Gas Packaged Heaters, Gas Utility Heaters And Gas-Fired Duct Furnaces
Table C403.3.2(4)

APSP

Pool & Hot Tub Alliance (formerly the Association of Pool and Spa Professionals
2111 Eisenhower Avenue, Suite 580
Alexandria, VA 22314

14—2019: American National Standard for Portable Electric Spa Energy Efficiency
C404.7

ASABE

American Society of Agricultural and Biological Engineers
2950 Niles Road
St. Joseph, MI 49085

S640—2017: Quantities and Units of Electromagnetic Radiation for Plants (Photosynthetic Organisms)
C405.4

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ASHRAE

ASHRAE
180 Technology Parkway NW
Peachtree Corners, GA 30092

55—2017: Thermal Environmental Conditions for Human Occupancy
Table C407.4.1(1)

90.1—2019: Energy Standard for Buildings Except Low-rise Residential Buildings
C402.1.4, C406.2

90.4—2016: Energy Standard for Data Centers
C403.1.2 , C405.2.4

140—2014: Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs
C407.5.1

146—2011: Testing for Rating Pool Heaters
Table C404.2

ANSI/ASHRAE/ACCA Standard 183—(RA2017): Peak Cooling and Heating Load Calculations in Buildings, Except Low-rise Residential Buildings
C403.1.1

ASHRAE—2020: HVAC Systems and Equipment Handbook—2020
C403.1.1

ISO/AHRI/ASHRAE 13256-1 (2012): Water-to-Air and Brine-to-Air Heat Pumps—Testing and Rating for Performance
Table C403.3.2(14)

ISO/AHRI/ASHRAE 13256-2 (2012): Water-to-Water and Brine-to-Water Heat Pumps—Testing and Rating for Performance
Table C403.3.2(14)

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990

ASME A17.1—2019/CSA B44—19: Safety Code for Elevators and Escalators
C405.9.2

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

C90—2016A: Specification for Load-bearing Concrete Masonry Units
Table C402.1.3

C1363—11: Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
C303.1.4.1, Table C402.1.4, 402.2.7

C1371—15: Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers
Table C402.3

C1549—2016: Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer
Table C402.3

D1003—13: Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics
C402.4.2.2

D8052/D8052M—2017: Standard Test Method for Quantification of Air Leakage in Low-Sloped Membrane Roof Assemblies
C402.5.2.1.2

E283—2004(2012): Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen
C402.5.1.4, Table C402.5.4, C402.5.10

E408—13: Test Methods for Total Normal Emittance of Surfaces Using Inspection-meter Techniques
Table C402.3

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ASTM—continued

E779—10(2018): Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
C402.5.3, C402.5.4, C406.9

E903—2012: Standard Test Method Solar Absorptance, Reflectance and Transmittance of Materials Using Integrating Spheres (Withdrawn 2005)
Table C402.3

E1677—11: Specification for Air Barrier (AB) Material or Systems for Low-rise Framed Building Walls
C402.5.2.1.2

E1827—2011(2017): Standard Test Methods for Determining Airtightness of Building Using an Orifice Blower Door
C402.5.3, C402.5.4, C406.9

E1918—06(2016): Standard Test Method for Measuring Solar Reflectance of Horizontal or Low-sloped Surfaces in the Field
Table C402.3

E1980—11: Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-sloped Opaque Surfaces
Table C402.3

E2178—13: Standard Test Method for Air Permanence of Building Materials
C402.5.2.1.1

E2357—2018: Standard Test Method for Determining Air Leakage of Air Barriers Assemblies
C402.5.2.1.2

F1281—2017: Specification for Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL_PEX) Pressure Pipe
Table C404.5.2.1

F1361—2017: Standard Test Method for Performance of Open Deep Fat Fryers
Table C406.12(1)

F1484—2018: Standard Test Method for Performance of Steam Cookers
Table C406.12(2)

F1495—2014a: Standard Specification for Combination Oven Electric or Gas Fired
Table C406.12(4)

F1496—2013: Standard Test Method for Performance of Convection Ovens
Table C406.12(4)

F1696—2018: Standard Test Method for Energy Performance of Stationary-Rack, Door-Type Commercial Dishwashing Machines
Table C406.12(3)

F1920—2015: Standard Test Method for Performance of Rack Conveyor Commercial Dishwashing Machines
Table C406.12(3)

F2093—2018: Standard Test Method for Performance of Rack Ovens
Table C406.12(4)

F2144—2017: Standard Test Method for Performance of Large Open Vat Fryers
Table C406.12(1)

F2861—2017: Standard Test Method for Enhanced Performance of Combination Oven in Various Modes
Table C406.12(4)

CRRC

Cool Roof Rating Council
2435 North Lombard Street
Portland, OR 97217

ANSI/CRRC S100—2020: Standard Test Methods for Determining Radiative Properties of Materials
Table C402.3, C402.3.1

CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland, OH 44131-5516

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors and Unit Skylights
Table C402.5.5

CSA B55.1—2015: Test Method for Measuring Efficiency and Pressure Loss of Drain Water Heat Recovery Units
C404.7

CSA B55.2—2015: Drain Water Heat Recovery Units
C404.7

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CTI

Cooling Technology Institute
P. O. Box 681807
Houston, TX 77268

ATC-105—2019: Acceptance Test Code for Water Cooling Towers
Table C403.3.2(7)

ATC-105DS—2018: Acceptance Test Code for Dry Fluid Coolers
Table C403.3.2(7)

ATC-105S—11: Acceptance Test Code for Closed Circuit Cooling Towers
Table C403.3.2(7), Table C403.3.2(8)

ATC-106—11: Acceptance Test for Mechanical Draft Evaporative Vapor Condensers
Table C403.3.2(7), Table C403.3.2(8)

CTI STD-201 RS(17): Performance Rating of Evaporative Heat Rejection Equipment
Table C403.3.2(7), Table C403.3.2(8)

DASMA

Door & Access Systems Manufacturers Association, International
1300 Sumner Avenue
Cleveland, OH 44115-2851

105—2017: Test Method for Thermal Transmittance and Air Infiltration of Garage Doors and Rolling Doors
C303.1.3, Table C402.5.5

DOE

US Department of Energy
c/o Superintendent of Documents
1000 Independence Avenue SW
Washington, DC 20585

10 CFR, Part 430—2015: Energy Conservation Program for Consumer Products: Test Procedures and Certification and Enforcement Requirement for Plumbing Products; and Certification and Enforcement Requirements for Residential Appliances; Final Rule
Table C403.3.2(1), Table C403.3.2(2), Table C403.3.2(5), Table C403.3.2(6), Table C403.3.2(14), Table C404.2

10 CFR, Part 431—2015: Energy Efficiency Program for Certain Commercial and Industrial Equipment: Test Procedures and Efficiency Standards; Final Rules
Table C403.3.2(6), C403.8.4, C403.11, C403.11.1, Table C403.11.1, C403.11.2, C405.7, Table C405.7, C405.8, Table C405.8(1), Table C405.8(2), Table C405.8(3), Table C405.8(4)

ICC

International Code Council, Inc.
500 New Jersey Avenue NW 6th Floor
Washington, DC 20001

IBC—21: International Building Code®
C201.3, C303.2, C402.5.6, C501.2

ICC 500—2020: Standard for the Design and Construction of Storm Shelters
C402.4.2

IFC—21: International Fire Code®
C201.3, C501.2

IFGC—21: International Fuel Gas Code®
C201.3, C501.2

IMC—21: International Mechanical Code®
C403.2.2, C403.6, C403.6.6, C403.7.1, C403.7.2, C403.7.4.2, C403.7.5, C403.7.7, C403.12.1, C403.12.2.1, C403.12.2.2, C406.6, C501.2

IPC—21: International Plumbing Code®
C201.3, C501.2

IPMC—21: International Property Maintenance Code®
C501.2

IPSDC—21: International Private Sewage Disposal Code®
C501.2

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IEEE

Institute of Electrical and Electronic Engineers
3 Park Avenue, 17th Floor
New York, NY 10016

IEEE 515.1—2012: IEEE Standard for the Testing, Design, Installation, and Maintenance of Electrical Resistance Trace Heating for Commercial Applications
C404.6.2

IES

Illuminating Engineering Society
120 Wall Street, 17th Floor
New York, NY 10005-4001

ANSI/ASHRAE/IES 90.1—2019: Energy Standard for Buildings, Except Low-rise Residential Buildings
C401.2, Table C402.1.3, Table C402.1.4, C406.2, C502.1, C503.1, C504.1

ISO

International Organization for Standardization
Chemin de Blandonnet 8, CP 401, 1214 Vernier
Geneva, Switzerland

ISO/AHRI/ASHRAE 13256-1(: 2017): Water-to-Air and Brine-to-Air Heat Pumps—Testing and Rating for Performance
Table C403.3.2(14)

ISO/AHRI/ASHRAE 13256-2(2017): Water-to-Water and Brine-to-Water Heat Pumps—Testing and Rating for Performance
Table C403.3.2(14)

NEMA

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, VA 22209

MG1—2016: Motors and Generators
C202

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

70—20: National Electrical Code
C501.2

NFRC

National Fenestration Rating Council, Inc.
6305 Ivy Lane, Suite 140
Greenbelt, MD 20770

100—2020: Procedure for Determining Fenestration Products *U*-factors
C303.1.3, Table 402.1.4, C402.2.1.5, C402.4.1.1

200—2020: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
C303.1.3, C402.4.1.1

203—2017: Procedure for Determining Visible Transmittance of Tubular Daylighting Devices
C303.1.3

400—2020: Procedure for Determining Fenestration Product Air Leakage
Table C402.5.5

SMACNA

Sheet Metal and Air Conditioning Contractors' National Association, Inc.
4021 Lafayette Center Drive
Chantilly, VA 20151-1219

ANSI/SMACNA 016—2012: HVAC Air Duct Leakage Test Manual Second Edition
C403.12.2.3

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UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062-2096

710—12: Exhaust Hoods for Commercial Cooking Equipment—with Revisions through November 2013
C403.7.5

727—18: Oil-fired Central Furnaces
Table C403.3.2(4), Table C403.3.2(5)

731—18: Oil-fired Unit Heaters
Table C403.3.2(5)

1784—15: Air Leakage Tests of Door Assemblies—with Revisions through February 2015
C402.5.6, C402.5.7

US-FTC

United States-Federal Trade Commission
600 Pennsylvania Avenue NW
Washington, DC 20580

CFR Title 16 (2015): *R*-value Rule
C303.1.4

WDMA

Window and Door Manufacturers Association
2025 M Street NW, Suite 800
Washington, DC 20036-3309

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors and Skylights
Table C402.5.5

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APPENDIX CA
BOARD OF APPEALS—COMMERCIAL

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User note:

About this appendix: *Appendix CA provides criteria for Board of Appeals members. Also provided are procedures by which the Board of Appeals should conduct its business.*

SECTION CA101
GENERAL

CA101.1 Scope. A board of appeals shall be established within the jurisdiction for the purpose of hearing applications for modification of the requirements of this code pursuant to the provisions of Section C110. The board shall be established and operated in accordance with this section, and shall be authorized to hear evidence from appellants and the code official pertaining to the application and intent of this code for the purpose of issuing orders pursuant to these provisions.

CA101.2 Application for appeal. Any person shall have the right to appeal a decision of the code official to the board. An application for appeal shall be based on a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.

CA101.2.1 Limitation of authority. The board shall not have authority to waive requirements of this code or interpret the administration of this code.

CA101.2.2 Stays of enforcement. Appeals of notice and orders, other than Imminent Danger notices, shall stay the enforcement of the notice and order until the appeal is heard by the board.

CA101.3 Membership of board. The board shall consist of five voting members appointed by the chief appointing authority of the jurisdiction. Each member shall serve for **[INSERT NUMBER OF YEARS]** years or until a successor has been appointed. The board member's terms shall be staggered at intervals, so as to provide continuity. The code official shall be an ex officio member of said board but shall not vote on any matter before the board.

CA101.3.1 Qualifications. The board shall consist of five individuals, who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.

CA101.3.2 Alternate members. The chief appointing authority is authorized to appoint two alternate members who shall be called by the board chairperson to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership, and shall be appointed for the same term or until a successor has been appointed.

CA101.3.3 Vacancies. Vacancies shall be filled for an unexpired term in the same manner in which original appointments are required to be made.

CA101.3.4 Chairperson. The board shall annually select one of its members to serve as chairperson.

CA101.3.5 Secretary. The chief appointing authority shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings which shall set forth the reasons for the board's decision, the vote of each member, the absence of a member and any failure of a member to vote.

CA101.3.6 Conflict of interest. A member with any personal, professional or financial interest in a matter before the board shall declare such interest and refrain from participating in discussions, deliberations and voting on such matters.

CA101.3.7 Compensation of members. Compensation of members shall be determined by law.

CA101.3.8 Removal from the board. A member shall be removed from the board prior to the end of their terms only for cause. Any member with continued absence from regular meeting of the board may be removed at the discretion of the chief appointing authority.

CA101.4 Rules and procedures. The board shall establish policies and procedures necessary to carry out its duties consistent with the provisions of this code and applicable state law. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be presented.

CA101.5 Notice of meeting. The board shall meet upon notice from the chairperson, within 10 days of the filing of an appeal or at stated periodic intervals.

CA101.5.1 Open hearing. All hearings before the board shall be open to the public. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

CA101.5.2 Quorum. Three members of the board shall constitute a quorum.

CA101.5.3 Postponed hearing. When five members are not present to hear an appeal, either the appellant or the

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appellant's representative shall have the right to request a postponement of the hearing.

CA101.6 Legal counsel. The jurisdiction shall furnish legal counsel to the board to provide members with general legal advice concerning matters before them for consideration. Members shall be represented by legal counsel at the jurisdiction's expense in all matters arising from service within the scope of their duties.

CA101.7 Board decision. The board shall only modify or reverse the decision of the code official by a concurring vote of three or more members.

CA101.7.1 Resolution. The decision of the board shall be by resolution. Every decision shall be promptly filed in writing in the office of the code official within three days and shall be open to the public for inspection. A certified copy shall be furnished to the appellant or the appellant's representative and to the code official.

CA101.7.2 Administration. The code official shall take immediate action in accordance with the decision of the board.

CA101.8 Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

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APPENDIX CB
SOLAR-READY ZONE—COMMERCIAL

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User note:

About this appendix: *Appendix CB is intended to encourage the installation of renewable energy systems by preparing buildings for the future installation of solar energy equipment, piping and wiring.*

SECTION CB101
SCOPE

CB101.1 General. These provisions shall be applicable for new construction where solar-ready provisions are required.

SECTION CB102
GENERAL DEFINITION

SOLAR-READY ZONE. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

SECTION CB103
SOLAR-READY ZONE

CB103.1 General. A solar-ready zone shall be located on the roof of buildings that are five stories or less in height above grade plane, and are oriented between 110 degrees and 270 degrees of true north or have low-slope roofs. Solar-ready zones shall comply with Sections CB103.2 through CB103.9.

Exceptions:

1. A building with a permanently installed, on-site renewable energy system.
2. A building with a solar-ready zone that is shaded for more than 70 percent of daylight hours annually.
3. A building where the licensed design professional certifies that the incident solar radiation available to the building is not suitable for a solar-ready zone.
4. A building where the licensed design professional certifies that the solar zone area required by Section CB103.3 cannot be met because of extensive rooftop equipment, skylights, vegetative roof areas or other obstructions.

CB103.2 Construction document requirements for a solar-ready zone. Construction documents shall indicate the solar-ready zone.

CB103.3 Solar-ready zone area. The total solar-ready zone area shall be not less than 40 percent of the roof area calculated as the horizontally projected gross roof area less the area covered by skylights, occupied roof decks, vegetative roof areas and mandatory *access* or set back areas as required by the *International Fire Code*. The solar-ready zone shall be a single area or smaller, separated sub-zone areas. Each sub-zone shall be not less than 5 feet (1524 mm) in width in the narrowest dimension.

CB103.4 Obstructions. Solar ready zones shall be free from obstructions, including pipes, vents, ducts, HVAC equipment, skylights and roof-mounted equipment.

CB103.5 Roof loads and documentation. A collateral dead load of not less than 5 pounds per square foot (5 psf) (24.41 kg/m^2) shall be included in the gravity and lateral design calculations for the solar-ready zone. The structural design loads for roof dead load and roof live load shall be indicated on the construction documents.

CB103.6 Interconnection pathway. Construction documents shall indicate pathways for routing of conduit or piping from the solar-ready zone to the electrical service panel and electrical energy storage system area or service hot water system.

CB103.7 Electrical energy storage system-ready area. The floor area of the electrical energy storage system-ready area shall be not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension, and located in accordance with Section 1207 of the *International Fire Code*. The location and layout diagram of the electrical energy storage system-ready area shall be indicated on the construction documents.

CB103.8 Electrical service reserved space. The main electrical service panel shall have a reserved space to allow installation of a dual-pole circuit breaker for future solar electric and a dual-pole circuit breaker for future electrical energy storage system installation. These spaces shall be labeled "For Future Solar Electric and Storage." The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

CB103.9 Construction documentation certificate. A permanent certificate, indicating the solar-ready zone and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

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APPENDIX CC
ZERO ENERGY COMMERCIAL BUILDING PROVISIONS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User note:

About this chapter: *Appendix CC provides a model for applying new renewable energy generation when new buildings add electric load to the grid. This renewable energy will avoid the additional emissions that would otherwise occur from conventional power generation.*

SECTION CC101
GENERAL

CC101.1 Purpose. The purpose of this appendix is to supplement the *International Energy Conservation Code* and require renewable energy systems of adequate capacity to achieve net zero carbon.

CC101.2 Scope. This appendix applies to new buildings that are addressed by the *International Energy Conservation Code*.

Exceptions:

1. Detached one- and two-family dwellings and townhouses as well as Group R-2 buildings three stories or less in height above grade plane, manufactured homes (mobile dwellings), and manufactured houses (modular dwellings).
2. Buildings that use neither electricity nor fossil fuel.

SECTION CC102
DEFINITIONS

CC102.1 Definitions. The definitions contained in this section supplement or modify the definitions in the *International Energy Conservation Code*.

ADJUSTED OFF-SITE RENEWABLE ENERGY. The amount of energy production from off-site renewable energy systems that may be used to offset building energy.

BUILDING ENERGY. All energy consumed at the *building site* as measured at the site boundary. Contributions from on-site or off-site renewable energy systems shall not be considered when determining the building energy.

ENERGY UTILIZATION INTENSITY (EUI). The site energy for either the baseline building or the proposed building divided by the gross *conditioned floor area* plus any semiheated floor area of the building. For the baseline building, the EUI can be divided between regulated energy use and unregulated energy use.

OFF-SITE RENEWABLE ENERGY SYSTEM. Renewable energy system not located on the building project.

ON-SITE RENEWABLE ENERGY SYSTEM. Renewable energy systems on the building project.

RENEWABLE ENERGY SYSTEM. Photovoltaic, solar thermal, geothermal energy and wind systems used to generate energy.

SEMIHEATED SPACE. An enclosed space within a building that is heated by a heating system whose output capacity is greater than or equal to 3.4 Btu/h × ft^2 of floor area but is not a conditioned space.

ZERO ENERGY PERFORMANCE INDEX (ZEPI PB/EE). The ratio of the proposed building EUI without renewables to the baseline building EUI, expressed as a percentage.

SECTION CC103
MINIMUM RENEWABLE ENERGY

CC103.1 Renewable energy. On-site renewable energy systems shall be installed, or off-site renewable energy shall be procured to offset the building energy as calculated in Equation CC-1.

$$RE_{onsite} + RE_{offsite} \geq E_{building} \qquad \textbf{(Equation CC-1)}$$

where:

RE_{onsite} = Annual site energy production from on-site renewable energy systems (see Section CC103.2).

$RE_{offsite}$ = Adjusted annual site energy production from off-site renewable energy systems that may be credited against building energy use (see Section CC103.3).

$E_{building}$ = Building energy use without consideration of renewable energy systems.

When Section C401.2.1(1) is used for compliance with the *International Energy Conservation Code*, building energy shall be determined by multiplying the gross *conditioned floor area* plus the gross semiheated floor area of the proposed building by an EUI selected from Table CC103.1. Use a weighted average for mixed-use buildings.

When Section C401.2.1, Item 2 or Section C401.2.2 is used for compliance with the *International Energy Conservation Code*, building energy shall be determined from energy simulations.

CC103.2 Calculation of on-site renewable energy. The annual energy production from on-site renewable energy

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TABLE CC103.1
ENERGY UTILIZATION INTENSITY FOR BUILDING TYPES AND CLIMATES (kBtu/ft² – yr)

BUILDING AREA TYPE	CLIMATE ZONE																
	0A/1A	0B/1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
	kBtu/ft² – yr																
Healthcare/hospital (I-2)	119	120	119	113	116	109	106	116	109	106	118	110	105	126	116	131	142
Hotel/motel (R-1)	73	76	73	68	70	67	65	69	66	65	71	68	65	77	72	81	89
Multiple-family (R-2)	43	45	41	41	43	42	36	45	43	41	47	46	41	53	48	53	59
Office (B)	31	32	30	29	29	28	25	28	27	25	29	28	25	33	30	32	36
Restaurant (A-2)	389	426	411	408	444	420	395	483	437	457	531	484	484	589	538	644	750
Retail (M)	46	50	45	46	44	44	37	48	44	44	52	50	46	60	52	64	77
School (E)	42	46	42	40	40	39	36	39	40	40	39	43	37	44	40	45	54
Warehouse (S)	9	12	9	11	12	11	10	17	13	14	23	17	15	32	23	32	32
All others	55	58	54	53	53	51	48	54	52	51	57	54	50	63	57	65	73

systems shall be determined using the PVWatts software or other software approved by the code official.

CC103.3 Off-site renewable energy. Off-site energy shall comply with Sections CC103.3.1 and CC103.3.2.

CC103.3.1 Qualifying off-site procurement methods. The following are considered qualifying off-site renewable energy procurement methods:

1. Community renewables: an off-site renewable energy system for which the owner has purchased or leased renewable energy capacity along with other subscribers.
2. Renewable energy investment fund: an entity that installs renewable energy capacity on behalf of the owner.
3. Virtual power purchase agreement: a power purchase agreement for off-site renewable energy where the owner agrees to purchase renewable energy output at a fixed price schedule.
4. Direct ownership: an off-site renewable energy system owned by the building project owner.
5. Direct access to wholesale market: an agreement between the owner and a renewable energy developer to purchase renewable energy.
6. Green retail tariffs: a program by the retail electricity provider to provide 100-percent renewable energy to the owner.
7. Unbundled Renewable Energy Certificates (RECs): certificates purchased by the owner representing the environmental benefits of renewable energy generation that are sold separately from the electric power.

CC103.3.2 Requirements for all procurement methods. The following requirements shall apply to all *off-site renewable* energy procurement methods:

1. The building owner shall sign a legally binding contract to procure qualifying off-site renewable energy.
2. The procurement contract shall have duration of not less than 15 years and shall be structured to survive a partial or full transfer of ownership of the property.
3. RECs and other environmental attributes associated with the procured *off-site renewable energy* shall be assigned to the building project for the duration of the contract.
4. The renewable energy generating source shall include one or more of the following: photovoltaic systems, solar thermal power plants, geothermal power plants and wind turbines.
5. The generation source shall be located where the energy can be delivered to the building site by the same utility or distribution entity, the same independent system operator (ISO) or regional transmission organization (RTO), or within integrated ISOs (electric coordination council).
6. The *off-site renewable energy* producer shall maintain transparent accounting that clearly assigns production to the building. Records on power sent to or purchased by the building shall be retained by the building owner and made available for inspection by the code official upon request.

CC103.3.3 Adjusted off-site renewable energy. The process for calculating the adjusted *off-site renewable energy* is shown in Equation CC-2.

$$RE_{offsite} = \sum_{i=1}^{n} PF_i \times RE_i = PF_1 \times RE_1 + PF_2 \times RE_2 + \ldots + PF_n \times RE_n$$

(Equation CC-2)

where:

$RE_{offsite}$ = Adjusted off-site renewable energy.

PF_i = Procurement factor for the i^{th} renewable energy procurement method or class taken from Table CC103.3.3.

RE_i = Annual energy production for the i^{th} renewable energy procurement method or class.

n = The number of renewable energy procurement options or classes considered.

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TABLE CC103.3.3
DEFAULT OFF-SITE RENEWABLE ENERGY PROCUREMENT METHODS, CLASSES AND COEFFICIENTS

CLASS	PROCUREMENT FACTOR (PF)	PROCUREMENT OPTIONS	ADDITIONAL REQUIREMENTS (see also Section CC103.3.2)
1	0.75	Community solar	—
		REIFs	Entity must be managed to prevent fraud or misuse of funds.
		Virtual PPA	—
		Self-owned off-site	Provisions shall prevent the generation from being sold separately from the building.
2	0.55	Green retail tariffs	The offering shall not include the purchase of unbundled RECs.
		Direct access	The offering shall not include the purchase of unbundled RECs.
3	0.20	Unbundled RECs	The vintage of the RECs shall align with building energy use.

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IECC—RESIDENTIAL PROVISIONS

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CHAPTER 1 [RE]
SCOPE AND ADMINISTRATION

User note:

About this chapter: *Chapter 1 establishes the limits of applicability of this code and describes how the code is to be applied and enforced. Chapter 1 is in two parts: Part 1—Scope and Application (Sections R101–R102) and Part 2—Administration and Enforcement (Sections R103–R110). Section R101 identifies which buildings and structures come under its purview and references other I-Codes as applicable. Standards and codes are scoped to the extent referenced (see Section R108.1).*

This code is intended to be adopted as a legally enforceable document, and it cannot be effective without adequate provisions for its administration and enforcement. The provisions of Chapter 1 establish the authority and duties of the code official appointed by the authority having jurisdiction and also establish the rights and privileges of the design professional, contractor and property owner.

PART 1—SCOPE AND APPLICATION

SECTION R101
SCOPE AND GENERAL REQUIREMENTS

R101.1 Title. This code shall be known as the *Energy Conservation Code* of **the City of Pueblo, Colorado** and shall be cited as such. It is referred to herein as "this code."

R101.2 Scope. This code applies to *residential buildings, building* sites and associated systems and equipment.

R101.3 Intent. This code shall regulate the design and construction of *buildings* for the effective use and conservation of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

R101.4 Applicability. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

R101.4.1 Mixed residential and commercial buildings. Where a *building* includes both *residential building* and *commercial building* portions, each portion shall be separately considered and meet the applicable provisions of the IECC—Commercial Provisions or IECC—Residential Provisions.

R101.5 Compliance. *Residential buildings* shall meet the provisions of IECC—Residential Provisions. *Commercial buildings* shall meet the provisions of IECC—Commercial Provisions.

R101.5.1 Compliance materials. The *code official* shall be permitted to approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code.

SECTION R102
ALTERNATIVE MATERIALS, DESIGN AND METHODS OF CONSTRUCTION AND EQUIPMENT

R102.1 General. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. The *code official* shall have the authority to approve an alternative material, design or method of construction upon the written application of the owner or the owner's authorized agent. The code official shall first find that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code for strength, effectiveness, fire resistance, durability, energy conservation and safety. The *code official* shall respond to the applicant, in writing, stating the reasons why the alternative was *approved* or was not *approved*.

R102.1.1 Above code programs. The *code official* or other authority having jurisdiction shall be permitted to deem a national, state or local energy-efficiency program to exceed the energy efficiency required by this code. *Buildings approved* in writing by such an energy-efficiency program shall be considered to be in compliance with this code where such buildings also meet the requirements identified in Table R405.2 and the *building thermal envelope* is greater than or equal to levels of efficiency and solar heat gain coefficients (SHGC) in Tables 402.1.1 and 402.1.3 of the 2009 *International Energy Conservation Code*.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION R103
CONSTRUCTION DOCUMENTS

R103.1 General. Construction documents, technical reports and other supporting data shall be submitted in one or more sets, or in a digital format where allowed by the *code official*, with each application for a permit. The construction documents and technical reports shall be prepared by a registered design professional where required by the statutes of the

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jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

Exception: The *code official* is authorized to waive the requirements for construction documents or other supporting data if the *code official* determines they are not necessary to confirm compliance with this code.

R103.2 Information on construction documents. Construction documents shall be drawn to scale on suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the *building*, systems and equipment as herein governed. Details shall include the following as applicable:

1. Energy compliance path.
2. Insulation materials and their *R*-values.
3. Fenestration *U*-factors and *solar heat gain coefficients* (SHGC).
4. Area-weighted *U*-factor and *solar heat gain coefficients* (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water-heating systems and equipment types, sizes and efficiencies.
7. Equipment and system controls.
8. Duct sealing, duct and pipe insulation and location.
9. Air sealing details.

R103.2.1 Building thermal envelope depiction. The *building thermal envelope* shall be represented on the construction documents.

R103.3 Examination of documents. The *code official* shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances. The *code official* is authorized to utilize a registered design professional, or other *approved* entity not affiliated with the building design or construction, in conducting the review of the plans and specifications for compliance with the code.

R103.3.1 Approval of construction documents. When the *code official* issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped "Reviewed for Code Compliance." Such *approved* construction documents shall not be changed, modified or altered without authorization from the *code official*. Work shall be done in accordance with the *approved* construction documents.

One set of construction documents so reviewed shall be retained by the *code official*. The other set shall be returned to the applicant, kept at the site of work and shall be open to inspection by the *code official* or a duly authorized representative.

R103.3.2 Previous approvals. This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

R103.3.3 Phased approval. The *code official* shall have the authority to issue a permit for the construction of part of an energy conservation system before the construction documents for the entire system have been submitted or *approved*, provided adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holders of such permit shall proceed at their own risk without assurance that the permit for the entire energy conservation system will be granted.

R103.4 Amended construction documents. Work shall be installed in accordance with the *approved* construction documents, and any changes made during construction that are not in compliance with the *approved* construction documents shall be resubmitted for approval as an amended set of construction documents.

R103.5 Retention of construction documents. One set of *approved* construction documents shall be retained by the *code official* for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

SECTION R104
FEES

R104.1 Fees. A permit shall not be issued until the fees prescribed in Section R104.2 have been paid, nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

R104.2 Schedule of permit fees. Where a permit is required, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

R104.3 Work commencing before permit issuance. Any person who commences any work before obtaining the necessary permits shall be subject to an additional fee established by the *code official* that shall be in addition to the required permit fees.

R104.4 Related fees. The payment of the fee for the construction, *alteration*, removal or demolition of work done in connection to or concurrently with the work or activity authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

R104.5 Refunds. The *code official* is authorized to establish a refund policy.

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SECTION R105
INSPECTIONS

R105.1 General. Construction or work for which a permit is required shall be subject to inspection by the *code official* or his or her designated agent, and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved*. It shall be the duty of the permit applicant to cause the work to remain visible and able to be accessed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material, product, system or building component required to allow inspection to validate compliance with this code.

R105.2 Required inspections. The *code official* or his or her designated agent, upon notification, shall make the inspections set forth in Sections R105.2.1 through R105.2.5.

R105.2.1 Footing and foundation inspection. Inspections associated with footings and foundations shall verify compliance with the code as to *R*-value, location, thickness, depth of burial and protection of insulation as required by the code and *approved* plans and specifications.

R105.2.2 Framing and rough-in inspection. Inspections at framing and rough-in shall be made before application of interior finish and shall verify compliance with the code as to: types of insulation and corresponding *R*-values and their correct location and proper installation; fenestration properties such as *U*-factor and SHGC and proper installation; air leakage controls as required by the code; and *approved* plans and specifications.

R105.2.3 Plumbing rough-in inspection. Inspections at plumbing rough-in shall verify compliance as required by the code and *approved* plans and specifications as to types of insulation and corresponding *R*-values and protection, and required controls.

R105.2.4 Mechanical rough-in inspection. Inspections at mechanical rough-in shall verify compliance as required by the code and *approved* plans and specifications as to installed HVAC equipment type and size, required controls, system insulation and corresponding *R*-value, system air leakage control, programmable thermostats, dampers, whole-house ventilation, and minimum fan efficiency.

Exception: Systems serving multiple dwelling units shall be inspected in accordance with Section C105.2.4.

R105.2.5 Final inspection. The *building* shall have a final inspection and shall not be occupied until *approved*. The final inspection shall include verification of the installation of all required *building* systems, equipment and controls and their proper operation and the required number of high-efficacy lamps and fixtures.

R105.3 Reinspection. A *building* shall be reinspected where determined necessary by the *code official*.

R105.4 Approved inspection agencies. The *code official* is authorized to accept reports of third-party inspection agencies not affiliated with the *building* design or construction, provided that such agencies are *approved* as to qualifications and reliability relevant to the *building* components and systems that they are inspecting.

R105.5 Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the *code official* when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

R105.6 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

SECTION R106
NOTICE OF APPROVAL

R106.1 Approval. After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the *code official*.

R106.2 Revocation. The *code official* is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the *building* or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION R107
VALIDITY

R107.1 General. If a portion of this code is held to be illegal or void, such a decision shall not affect the validity of the remainder of this code.

SECTION R108
REFERENCED STANDARDS

R108.1 Referenced codes and standards. The codes and standards referenced in this code shall be those indicated in Chapter 6, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections R108.1.1 and R108.1.2.

R108.1.1 Conflicts. Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

R108.1.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

R108.2 Application of references. References to chapter or section numbers, or to provisions not specifically identified

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by number, shall be construed to refer to such chapter, section or provision of this code.

R108.3 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

SECTION R109
STOP WORK ORDER

R109.1 Authority. Where the *code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the *code official* is authorized to issue a stop work order.

R109.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property, the owner's authorized agent or the person performing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume.

R109.3 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

R109.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fines established by the authority having jurisdiction.

SECTION R110
MEANS OF APPEALS

R110.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the code official.

R110.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code or interpret the administration of this code.

R110.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction.

R110.4 Administration. The code official shall take immediate action in accordance with the decision of the board.

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CHAPTER 2 [RE]
DEFINITIONS

User note:

About this chapter: *Codes, by their very nature, are technical documents. Every word, term and punctuation mark can add to or change the meaning of a technical requirement. It is necessary to maintain a consensus on the specific meaning of each term contained in the code. Chapter 2 performs this function by stating clearly what specific terms mean for the purpose of the code.*

SECTION R201
GENERAL

R201.1 Scope. Unless stated otherwise, the following words and terms in this code shall have the meanings indicated in this chapter.

R201.2 Interchangeability. Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural includes the singular.

R201.3 Terms defined in other codes. Terms that are not defined in this code but are defined in the *International Building Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *International Plumbing Code* or the *International Residential Code* shall have the meanings ascribed to them in those codes.

R201.4 Terms not defined. Terms not defined by this chapter shall have ordinarily accepted meanings such as the context implies.

SECTION R202
GENERAL DEFINITIONS

ABOVE-GRADE WALL. A wall more than 50 percent above grade and enclosing *conditioned space*. This includes between-floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and *skylight* shafts.

ACCESS (TO). That which enables a device, appliance or equipment to be reached by *ready access* or by a means that first requires the removal or movement of a panel or similar obstruction.

ADDITION. An extension or increase in the *conditioned space* floor area, number of stories or height of a building or structure.

AIR BARRIER. One or more materials joined together in a continuous manner to restrict or prevent the passage of air through the *building thermal envelope* and its assemblies.

ALTERATION. Any construction, retrofit or renovation to an existing structure other than *repair* or *addition*. Also, a change in a building, electrical, gas, mechanical or plumbing system that involves an extension, addition or change to the arrangement, type or purpose of the original installation.

APPROVED. Acceptable to the *code official.*

APPROVED AGENCY. An established and recognized agency that is regularly engaged in conducting tests furnishing inspection services, or furnishing product certification, where such agency has been *approved* by the *code official.*

AUTOMATIC. Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current strength, pressure, temperature or mechanical configuration (see "*Manual*").

BASEMENT WALL. A wall 50 percent or more below grade and enclosing *conditioned space.*

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy, including any mechanical systems, service water-heating systems and electric power and lighting systems located on the building site and supporting the building.

BUILDING SITE. A contiguous area of land that is under the ownership or control of one entity.

BUILDING THERMAL ENVELOPE. The *basement walls, exterior walls,* floors, ceiling, roofs and any other *building* element assemblies that enclose *conditioned space* or provide a boundary between *conditioned space* and exempt or unconditioned space.

CAVITY INSULATION. Insulating material located between framing members.

CIRCULATING HOT WATER SYSTEM. A specifically designed water distribution system where one or more pumps are operated in the service hot water piping to circulate heated water from the water-heating equipment to fixtures and back to the water-heating equipment.

CLIMATE ZONE. A geographical region based on climatic criteria as specified in this code.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code or a duly authorized representative.

COMMERCIAL BUILDING. For this code, all buildings that are not included in the definition of "*Residential building*."

CONDITIONED FLOOR AREA. The horizontal projection of the floors associated with the *conditioned space*.

CONDITIONED SPACE. An area, room or space that is enclosed within the *building thermal envelope* and that is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from

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conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

CONTINUOUS AIR BARRIER. A combination of materials and assemblies that restrict or prevent the passage of air through the *building thermal envelope*.

CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior, or is integral to any opaque surface, of the *building* envelope.

CRAWL SPACE WALL. The opaque portion of a wall that encloses a crawl space and is partially or totally below grade.

CURTAIN WALL. Fenestration products used to create an external nonload-bearing wall that is designed to separate the exterior and interior environments.

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where one or more pumps prime the service hot water piping with heated water upon demand for hot water.

DIMMER. A control device that is capable of continuously varying the light output and energy use of light sources.

DUCT. A tube or conduit utilized for conveying air. The air passages of self-contained systems are not to be construed as air ducts.

DUCT SYSTEM. A continuous passageway for the transmission of air that, in addition to ducts, includes duct fittings, dampers, plenums, fans and accessory air-handling equipment and appliances.

DWELLING UNIT. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

DWELLING UNIT ENCLOSURE AREA. The sum of the area of ceiling, floors, and walls separating a *dwelling unit's conditioned space* from the exterior or from adjacent conditioned or unconditioned spaces. Wall height shall be measured from the finished floor of the *dwelling unit* to the underside of the floor above.

ENERGY ANALYSIS. A method for estimating the annual energy use of the *proposed design* and *standard reference design* based on estimates of energy use.

ENERGY COST. The total estimated annual cost for purchased energy for the building functions regulated by this code, including applicable demand charges.

ENERGY SIMULATION TOOL. An *approved* software program or calculation-based methodology that projects the annual energy use of a *building*.

ERI REFERENCE DESIGN. A version of the *rated design* that meets the minimum requirements of the 2006 *International Energy Conservation Code*.

EXTERIOR WALL. Walls including both *above-grade walls* and *basement walls*.

FENESTRATION. Products classified as either *vertical fenestration* or *skylights*.

Skylights. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal including unit skylights, tubular daylighting devices, and glazing materials in solariums, sunrooms, roofs and sloped walls.

Vertical fenestration. Windows that are fixed or operable, opaque doors, glazed doors, glazed block and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope of not less than 60 degrees (1.05 rad) from horizontal.

FENESTRATION PRODUCT, SITE-BUILT. A fenestration designed to be made up of field-glazed or field-assembled units using specific factory cut or otherwise factory-formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls and atrium roof systems.

HEATED SLAB. Slab-on-grade construction in which the heating elements, hydronic tubing, or hot air distribution system is in contact with, or placed within or under, the slab.

HIGH-EFFICACY LIGHT SOURCES. Any lamp with an efficacy of not less than 65 lumens per watt, or luminaires with an efficacy of not less than 45 lumens per watt.

HISTORIC BUILDING. Any building or structure that is one or more of the following:

1. Listed, or certified as eligible for listing by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.
2. Designated as historic under an applicable state or local law.
3. Certified as a contributing resource within a National Register-listed, state-designated or locally designated historic district.

INFILTRATION. The uncontrolled inward air leakage into a *building* caused by the pressure effects of wind or the effect of differences in the indoor and outdoor air density or both.

INSULATED SIDING. A type of continuous insulation with manufacturer-installed insulating material as an integral part of the cladding product having an *R*-value of not less than R-2.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, *approved* agency or other organization concerned with product evaluation that maintains periodic inspection of the production of such labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the *code official* and concerned with evaluation of products or

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services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

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MANUAL. Capable of being operated by personal intervention (see "*Automatic*").

OCCUPANT SENSOR CONTROL. An automatic control device that detects the presence or absence of people within an area and causes lighting, equipment or appliances to be regulated accordingly.

ON-SITE RENEWABLE ENERGY. Energy from renewable energy resources harvested at the building site.

OPAQUE DOOR. A door that is not less than 50-percent opaque in surface area.

PROPOSED DESIGN. A description of the proposed *building* used to estimate annual energy use for determining compliance based on total building performance.

RATED DESIGN. A description of the proposed *building* used to determine the energy rating index.

READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached without requiring the removal or movement of any panel or similar obstruction.

RENEWABLE ENERGY CERTIFICATE (REC). An instrument that represents the environmental attributes of one megawatt hour of renewable energy; also known as an energy attribute certificate (EAC).

RENEWABLE ENERGY RESOURCES. Energy derived from solar radiation, wind, waves, tides, landfill gas, biogas, biomass or extracted from hot fluid or steam heated within the earth.

REPAIR. The reconstruction or renewal of any part of an existing *building* for the purpose of its maintenance or to correct damage.

REROOFING. The process of recovering or replacing an existing roof covering. See "*Roof recover*" and "*Roof replacement*."

RESIDENTIAL BUILDING. For this code, includes detached one- and two-family dwellings and townhouses as well as *Group R*-2, *R*-3 and *R*-4 buildings three stories or less in height above grade plane.

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly includes the roof covering, underlayment and roof deck and can also include a thermal barrier, an ignition barrier, insulation or a vapor retarder.

ROOF RECOVER. The process of installing an additional roof covering over an existing roof covering without removing the existing roof covering.

ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

***R*-VALUE (THERMAL RESISTANCE).** The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area ($h \times ft^2 \times °F/Btu$) [$(m^2 \times K)/W$].

SERVICE WATER HEATING. Supply of hot water for purposes other than comfort heating.

SOLAR HEAT GAIN COEFFICIENT (SHGC). The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation that is then reradiated, conducted or convected into the space.

STANDARD REFERENCE DESIGN. A version of the *proposed design* that meets the minimum requirements of this code and is used to determine the maximum annual energy use requirement for compliance based on total building performance.

SUNROOM. A one-story structure attached to a dwelling with a glazing area in excess of 40 percent of the gross area of the structure's *exterior walls* and roof.

THERMAL DISTRIBUTION EFFICIENCY (TDE). The resistance to changes in air heat as air is conveyed through a distance of air duct. TDE is a heat loss calculation evaluating the difference in the heat of the air between the air duct inlet and outlet caused by differences in temperatures between the air in the duct and the duct material. TDE is expressed as a percent difference between the inlet and outlet heat in the duct.

THERMAL ISOLATION. Physical and space conditioning separation from *conditioned spaces*. The *conditioned spaces* shall be controlled as separate zones for heating and cooling or conditioned by separate equipment.

THERMOSTAT. An automatic control device used to maintain temperature at a fixed or adjustable setpoint.

***U*-FACTOR (THERMAL TRANSMITTANCE).** The coefficient of heat transmission (air to air) through a building component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films ($Btu/h \times ft^2 \times °F$) [$W/(m^2 \times K)$].

VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

VENTILATION AIR. That portion of supply air that comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

VISIBLE TRANSMITTANCE (VT). The ratio of visible light entering the space through the fenestration product assembly to the incident visible light. Visible Transmittance includes the effects of glazing material and frame and is expressed as a number between 0 and 1.

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VENTILATION AIR. That portion of supply air that comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

VISIBLE TRANSMITTANCE (VT). The ratio of visible light entering the space through the fenestration product assembly to the incident visible light. Visible Transmittance includes the effects of glazing material and frame and is expressed as a number between 0 and 1.

WHOLE HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air with outdoor air when operating continuously or through a programmed intermittent schedule to satisfy the whole house ventilation rates.

ZONE. A space or group of spaces within a *building* with heating or cooling requirements that are sufficiently similar so that desired conditions can be maintained throughout using a single controlling device.

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CHAPTER 3 [RE]
GENERAL REQUIREMENTS

User note:

About this chapter: *Chapter 3 addresses broadly applicable requirements that would not be at home in other chapters having more specific coverage of subject matter. This chapter establishes climate zone by US counties and territories and includes methodology for determining climate zones elsewhere. It also contains product rating, marking and installation requirements for materials such as insulation, windows, doors and siding.*

SECTION R301
CLIMATE ZONES

R301.1 General. *Climate zones* from Figure R301.1 or Table R301.1 shall be used for determining the applicable requirements from Chapter 4. Locations not indicated in Table R301.1 shall be assigned a *climate zone* in accordance with Section R301.3.

R301.2 Warm Humid counties. In Table R301.1, Warm Humid counties are identified by an asterisk.

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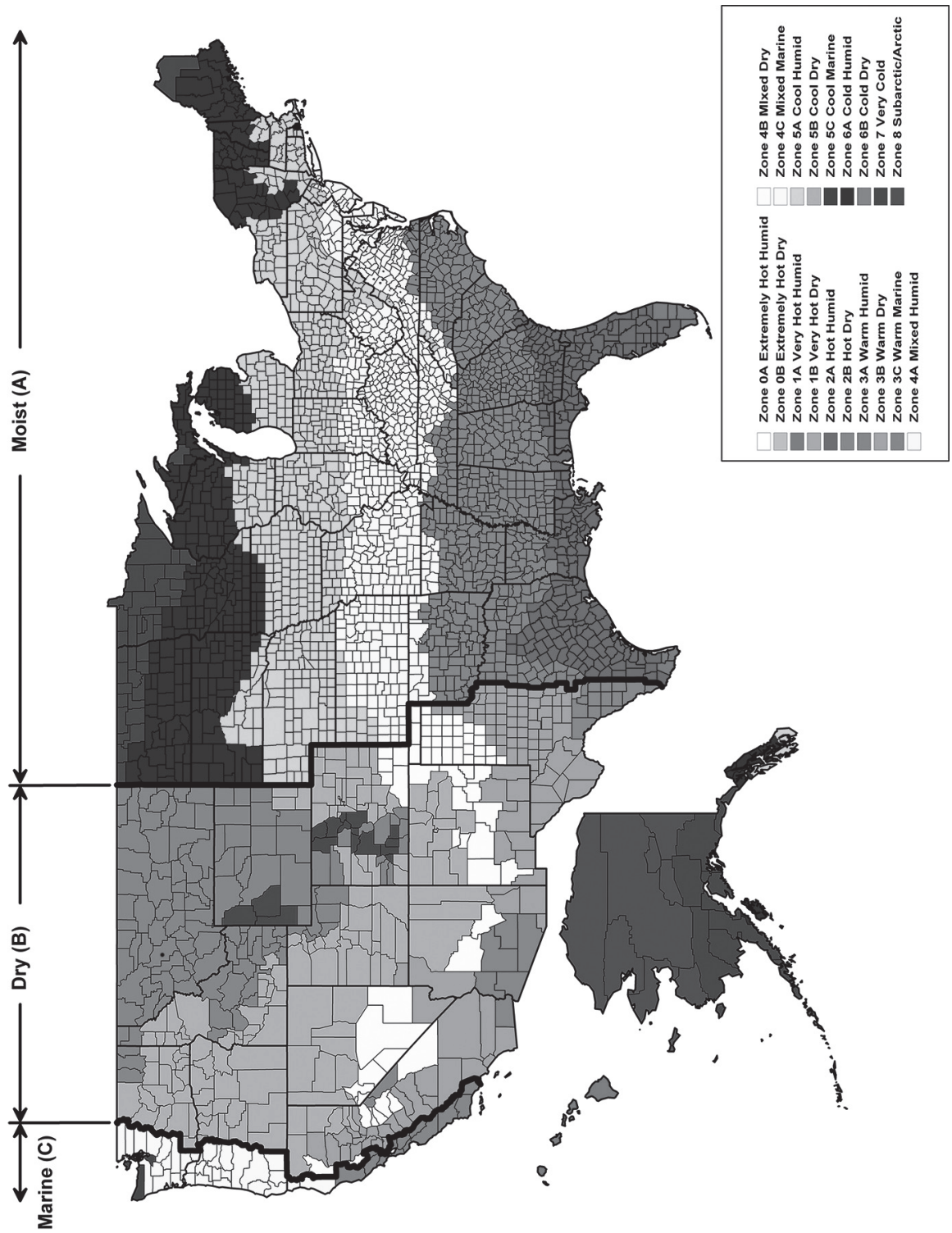


FIGURE R301.1
CLIMATE ZONES

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TABLE R301.1
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES
ALABAMA
3A Autauga*
2A Baldwin*
3A Barbour*
3A Bibb
3A Blount
3A Bullock*
3A Butler*
3A Calhoun
3A Chambers
3A Cherokee
3A Chilton
3A Choctaw*
3A Clarke*
3A Clay
3A Cleburne
2A Coffee*
3A Colbert
3A Conecuh*
3A Coosa
2A Covington*
3A Crenshaw*
3A Cullman
2A Dale*
3A Dallas*
3A DeKalb
3A Elmore*
2A Escambia*
3A Etowah
3A Fayette
3A Franklin
2A Geneva*
3A Greene
3A Hale
2A Henry*
2A Houston*
3A Jackson
3A Jefferson
3A Lamar
3A Lauderdale
3A Lawrence
3A Lee
3A Limestone
3A Lowndes*
3A Macon*
3A Madison
3A Marengo*
3A Marion
3A Marshall
2A Mobile*
3A Monroe*
3A Montgomery*
3A Morgan
3A Perry*
3A Pickens
3A Pike*
3A Randolph
3A Russell*
3A Shelby
3A St. Clair
3A Sumter
3A Talladega
3A Tallapoosa
3A Tuscaloosa
3A Walker
3A Washington*
3A Wilcox*
3A Winston
ALASKA
7 Aleutians East
7 Aleutians West
7 Anchorage
7 Bethel
7 Bristol Bay
8 Denali
7 Dillingham
8 Fairbanks North Star
6A Haines
6A Juneau
7 Kenai Peninsula
5C Ketchikan Gateway
6A Kodiak Island
7 Lake and Peninsula
7 Matanuska-Susitna
8 Nome
8 North Slope
8 Northwest Arctic

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ALASKA *(continued)*
5C Prince of Wales Outer Ketchikan
5C Sitka
6A Skagway-Hoonah-Angoon
8 Southeast Fairbanks
7 Valdez-Cordova
8 Wade Hampton
6A Wrangell-Petersburg
7 Yakutat
8 Yukon-Koyukuk
ARIZONA
5B Apache
3B Cochise
5B Coconino
4B Gila
3B Graham
3B Greenlee
2B La Paz
2B Maricopa
3B Mohave
5B Navajo
2B Pima
2B Pinal
3B Santa Cruz
4B Yavapai
2B Yuma
ARKANSAS
3A Arkansas
3A Ashley
4A Baxter
4A Benton
4A Boone
3A Bradley
3A Calhoun
4A Carroll
3A Chicot
3A Clark
3A Clay
3A Cleburne
3A Cleveland
3A Columbia*
3A Conway
3A Craighead
3A Crawford
3A Crittenden
3A Cross
3A Dallas
3A Desha
3A Drew
3A Faulkner
3A Franklin
4A Fulton
3A Garland
3A Grant
3A Greene
3A Hempstead*
3A Hot Spring
3A Howard
3A Independence
4A Izard
3A Jackson
3A Jefferson
3A Johnson
3A Lafayette*
3A Lawrence
3A Lee
3A Lincoln
3A Little River*
3A Logan
3A Lonoke
4A Madison
4A Marion
3A Miller*
3A Mississippi
3A Monroe
3A Montgomery
3A Nevada
4A Newton
3A Ouachita
3A Perry
3A Phillips
3A Pike
3A Poinsett
3A Polk
3A Pope
3A Prairie
3A Pulaski
3A Randolph

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ARKANSAS *(continued)*
3A Saline
3A Scott
4A Searcy
3A Sebastian
3A Sevier*
3A Sharp
3A St. Francis
4A Stone
3A Union*
3A Van Buren
4A Washington
3A White
3A Woodruff
3A Yell
CALIFORNIA
3C Alameda
6B Alpine
4B Amador
3B Butte
4B Calaveras
3B Colusa
3B Contra Costa
4C Del Norte
4B El Dorado
3B Fresno
3B Glenn
4C Humboldt
2B Imperial
4B Inyo
3B Kern
3B Kings
4B Lake
5B Lassen
3B Los Angeles
3B Madera
3C Marin
4B Mariposa
3C Mendocino
3B Merced
5B Modoc
6B Mono
3C Monterey
3C Napa
5B Nevada
3B Orange
3B Placer
5B Plumas
3B Riverside
3B Sacramento
3C San Benito
3B San Bernardino
3B San Diego
3C San Francisco
3B San Joaquin
3C San Luis Obispo
3C San Mateo
3C Santa Barbara
3C Santa Clara
3C Santa Cruz
3B Shasta
5B Sierra
5B Siskiyou
3B Solano
3C Sonoma
3B Stanislaus
3B Sutter
3B Tehama
4B Trinity
3B Tulare
4B Tuolumne
3C Ventura
3B Yolo
3B Yuba
COLORADO
5B Adams
6B Alamosa
5B Arapahoe
6B Archuleta
4B Baca
4B Bent
5B Boulder
5B Broomfield
6B Chaffee
5B Cheyenne
7 Clear Creek
6B Conejos
6B Costilla
5B Crowley

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
COLORADO *(continued)*
5B Custer
5B Delta
5B Denver
6B Dolores
5B Douglas
6B Eagle
5B Elbert
5B El Paso
5B Fremont
5B Garfield
5B Gilpin
7 Grand
7 Gunnison
7 Hinsdale
5B Huerfano
7 Jackson
5B Jefferson
5B Kiowa
5B Kit Carson
7 Lake
5B La Plata
5B Larimer
4B Las Animas
5B Lincoln
5B Logan
5B Mesa
7 Mineral
6B Moffat
5B Montezuma
5B Montrose
5B Morgan
4B Otero
6B Ouray
7 Park
5B Phillips
7 Pitkin
4B Prowers
5B Pueblo
6B Rio Blanco
7 Rio Grande
7 Routt
6B Saguache
7 San Juan
6B San Miguel
5B Sedgwick
7 Summit
5B Teller
5B Washington
5B Weld
5B Yuma
CONNECTICUT
5A (all)
DELAWARE
4A (all)
DISTRICT OF COLUMBIA
4A (all)
FLORIDA
2A Alachua*
2A Baker*
2A Bay*
2A Bradford*
2A Brevard*
1A Broward*
2A Calhoun*
2A Charlotte*
2A Citrus*
2A Clay*
2A Collier*
2A Columbia*
2A DeSoto*
2A Dixie*
2A Duval*
2A Escambia*
2A Flagler*
2A Franklin*
2A Gadsden*
2A Gilchrist*
2A Glades*
2A Gulf*
2A Hamilton*
2A Hardee*
2A Hendry*
2A Hernando*
2A Highlands*
2A Hillsborough*
2A Holmes*
2A Indian River*
2A Jackson*

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
FLORIDA *(continued)*
2A Jefferson*
2A Lafayette*
2A Lake*
2A Lee*
2A Leon*
2A Levy*
2A Liberty*
2A Madison*
2A Manatee*
2A Marion*
2A Martin*
1A Miami-Dade*
1A Monroe*
2A Nassau*
2A Okaloosa*
2A Okeechobee*
2A Orange*
2A Osceola*
1A Palm Beach*
2A Pasco*
2A Pinellas*
2A Polk*
2A Putnam*
2A Santa Rosa*
2A Sarasota*
2A Seminole*
2A St. Johns*
2A St. Lucie*
2A Sumter*
2A Suwannee*
2A Taylor*
2A Union*
2A Volusia*
2A Wakulla*
2A Walton*
2A Washington*
GEORGIA
2A Appling*
2A Atkinson*
2A Bacon*
2A Baker*
3A Baldwin
3A Banks
3A Barrow
3A Bartow
3A Ben Hill*
2A Berrien*
3A Bibb
3A Bleckley*
2A Brantley*
2A Brooks*
2A Bryan*
3A Bulloch*
3A Burke
3A Butts
2A Calhoun*
2A Camden*
3A Candler*
3A Carroll
3A Catoosa
2A Charlton*
2A Chatham*
3A Chattahoochee*
3A Chattooga
3A Cherokee
3A Clarke
3A Clay*
3A Clayton
2A Clinch*
3A Cobb
2A Coffee*
2A Colquitt*
3A Columbia
2A Cook*
3A Coweta
3A Crawford
3A Crisp*
3A Dade
3A Dawson
2A Decatur*
3A DeKalb
3A Dodge*
3A Dooly*
2A Dougherty*
3A Douglas
2A Early*
2A Echols*
2A Effingham*

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
GEORGIA *(continued)*
3A Elbert
3A Emanuel*
2A Evans*
3A Fannin
3A Fayette
3A Floyd
3A Forsyth
3A Franklin
3A Fulton
3A Gilmer
3A Glascock
2A Glynn*
3A Gordon
2A Grady*
3A Greene
3A Gwinnett
3A Habersham
3A Hall
3A Hancock
3A Haralson
3A Harris
3A Hart
3A Heard
3A Henry
3A Houston*
3A Irwin*
3A Jackson
3A Jasper
2A Jeff Davis*
3A Jefferson
3A Jenkins*
3A Johnson*
3A Jones
3A Lamar
2A Lanier*
3A Laurens*
3A Lee*
2A Liberty*
3A Lincoln
2A Long*
2A Lowndes*
3A Lumpkin
3A Macon*
3A Madison
3A Marion*
3A McDuffie
2A McIntosh*
3A Meriwether
2A Miller*
2A Mitchell*
3A Monroe
3A Montgomery*
3A Morgan
3A Murray
3A Muscogee
3A Newton
3A Oconee
3A Oglethorpe
3A Paulding
3A Peach*
3A Pickens
2A Pierce*
3A Pike
3A Polk
3A Pulaski*
3A Putnam
3A Quitman*
3A Rabun
3A Randolph*
3A Richmond
3A Rockdale
3A Schley*
3A Screven*
2A Seminole*
3A Spalding
3A Stephens
3A Stewart*
3A Sumter*
3A Talbot
3A Taliaferro
2A Tattnall*
3A Taylor*
3A Telfair*
3A Terrell*
2A Thomas*
2A Tift*
2A Toombs*
3A Towns

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
GEORGIA *(continued)*
3A Treutlen*
3A Troup
3A Turner*
3A Twiggs*
3A Union
3A Upson
3A Walker
3A Walton
2A Ware*
3A Warren
3A Washington
2A Wayne*
3A Webster*
3A Wheeler*
3A White
3A Whitfield
3A Wilcox*
3A Wilkes
3A Wilkinson
2A Worth*
HAWAII
1A (all)*
IDAHO
5B Ada
6B Adams
6B Bannock
6B Bear Lake
5B Benewah
6B Bingham
6B Blaine
6B Boise
6B Bonner
6B Bonneville
6B Boundary
6B Butte
6B Camas
5B Canyon
6B Caribou
5B Cassia
6B Clark
5B Clearwater
6B Custer
5B Elmore
6B Franklin
6B Fremont
5B Gem
5B Gooding
5B Idaho
6B Jefferson
5B Jerome
5B Kootenai
5B Latah
6B Lemhi
5B Lewis
5B Lincoln
6B Madison
5B Minidoka
5B Nez Perce
6B Oneida
5B Owyhee
5B Payette
5B Power
5B Shoshone
6B Teton
5B Twin Falls
6B Valley
5B Washington
ILLINOIS
5A Adams
4A Alexander
4A Bond
5A Boone
5A Brown
5A Bureau
4A Calhoun
5A Carroll
5A Cass
5A Champaign
4A Christian
4A Clark
4A Clay
4A Clinton
4A Coles
5A Cook
4A Crawford
4A Cumberland
5A DeKalb
5A De Witt

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ILLINOIS *(continued)*
5A Douglas
5A DuPage
5A Edgar
4A Edwards
4A Effingham
4A Fayette
5A Ford
4A Franklin
5A Fulton
4A Gallatin
4A Greene
5A Grundy
4A Hamilton
5A Hancock
4A Hardin
5A Henderson
5A Henry
5A Iroquois
4A Jackson
4A Jasper
4A Jefferson
4A Jersey
5A Jo Daviess
4A Johnson
5A Kane
5A Kankakee
5A Kendall
5A Knox
5A Lake
5A La Salle
4A Lawrence
5A Lee
5A Livingston
5A Logan
5A Macon
4A Macoupin
4A Madison
4A Marion
5A Marshall
5A Mason
4A Massac
5A McDonough
5A McHenry
5A McLean
5A Menard
5A Mercer
4A Monroe
4A Montgomery
5A Morgan
5A Moultrie
5A Ogle
5A Peoria
4A Perry
5A Piatt
5A Pike
4A Pope
4A Pulaski
5A Putnam
4A Randolph
4A Richland
5A Rock Island
4A Saline
5A Sangamon
5A Schuyler
5A Scott
4A Shelby
5A Stark
4A St. Clair
5A Stephenson
5A Tazewell
4A Union
5A Vermilion
4A Wabash
5A Warren
4A Washington
4A Wayne
4A White
5A Whiteside
5A Will
4A Williamson
5A Winnebago
5A Woodford
INDIANA
5A Adams
5A Allen
4A Bartholomew
5A Benton
5A Blackford
5A Boone
4A Brown

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
INDIANA *(continued)*
5A Carroll
5A Cass
4A Clark
4A Clay
5A Clinton
4A Crawford
4A Daviess
4A Dearborn
4A Decatur
5A De Kalb
5A Delaware
4A Dubois
5A Elkhart
4A Fayette
4A Floyd
5A Fountain
4A Franklin
5A Fulton
4A Gibson
5A Grant
4A Greene
5A Hamilton
5A Hancock
4A Harrison
4A Hendricks
5A Henry
5A Howard
5A Huntington
4A Jackson
5A Jasper
5A Jay
4A Jefferson
4A Jennings
4A Johnson
4A Knox
5A Kosciusko
5A LaGrange
5A Lake
5A LaPorte
4A Lawrence
5A Madison
4A Marion
5A Marshall
4A Martin
5A Miami
4A Monroe
5A Montgomery
4A Morgan
5A Newton
5A Noble
4A Ohio
4A Orange
4A Owen
5A Parke
4A Perry
4A Pike
5A Porter
4A Posey
5A Pulaski
4A Putnam
5A Randolph
4A Ripley
4A Rush
4A Scott
4A Shelby
4A Spencer
5A Starke
5A Steuben
5A St. Joseph
4A Sullivan
4A Switzerland
5A Tippecanoe
5A Tipton
4A Union
4A Vanderburgh
5A Vermillion
4A Vigo
5A Wabash
5A Warren
4A Warrick
4A Washington
5A Wayne
5A Wells
5A White
5A Whitley
IOWA
5A Adair
5A Adams

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
IOWA *(continued)*
5A Allamakee
5A Appanoose
5A Audubon
5A Benton
6A Black Hawk
5A Boone
5A Bremer
5A Buchanan
5A Buena Vista
5A Butler
5A Calhoun
5A Carroll
5A Cass
5A Cedar
6A Cerro Gordo
5A Cherokee
5A Chickasaw
5A Clarke
6A Clay
5A Clayton
5A Clinton
5A Crawford
5A Dallas
5A Davis
5A Decatur
5A Delaware
5A Des Moines
6A Dickinson
5A Dubuque
6A Emmet
5A Fayette
5A Floyd
5A Franklin
5A Fremont
5A Greene
5A Grundy
5A Guthrie
5A Hamilton
6A Hancock
5A Hardin
5A Harrison
5A Henry
5A Howard
5A Humboldt
5A Ida
5A Iowa
5A Jackson
5A Jasper
5A Jefferson
5A Johnson
5A Jones
5A Keokuk
6A Kossuth
5A Lee
5A Linn
5A Louisa
5A Lucas
6A Lyon
5A Madison
5A Mahaska
5A Marion
5A Marshall
5A Mills
6A Mitchell
5A Monona
5A Monroe
5A Montgomery
5A Muscatine
6A O'Brien
6A Osceola
5A Page
6A Palo Alto
5A Plymouth
5A Pocahontas
5A Polk
5A Pottawattamie
5A Poweshiek
5A Ringgold
5A Sac
5A Scott
5A Shelby
6A Sioux
5A Story
5A Tama
5A Taylor
5A Union
5A Van Buren
5A Wapello

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
IOWA *(continued)*
5A Warren
5A Washington
5A Wayne
5A Webster
6A Winnebago
5A Winneshiek
5A Woodbury
6A Worth
5A Wright
KANSAS
4A Allen
4A Anderson
4A Atchison
4A Barber
4A Barton
4A Bourbon
4A Brown
4A Butler
4A Chase
4A Chautauqua
4A Cherokee
5A Cheyenne
4A Clark
4A Clay
4A Cloud
4A Coffey
4A Comanche
4A Cowley
4A Crawford
5A Decatur
4A Dickinson
4A Doniphan
4A Douglas
4A Edwards
4A Elk
4A Ellis
4A Ellsworth
4A Finney
4A Ford
4A Franklin
4A Geary
5A Gove
4A Graham
4A Grant
4A Gray
5A Greeley
4A Greenwood
4A Hamilton
4A Harper
4A Harvey
4A Haskell
4A Hodgeman
4A Jackson
4A Jefferson
5A Jewell
4A Johnson
4A Kearny
4A Kingman
4A Kiowa
4A Labette
4A Lane
4A Leavenworth
4A Lincoln
4A Linn
5A Logan
4A Lyon
4A Marion
4A Marshall
4A McPherson
4A Meade
4A Miami
4A Mitchell
4A Montgomery
4A Morris
4A Morton
4A Nemaha
4A Neosho
4A Ness
5A Norton
4A Osage
4A Osborne
4A Ottawa
4A Pawnee
5A Phillips
4A Pottawatomie
4A Pratt
5A Rawlins
4A Reno

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
KANSAS *(continued)*
5A Republic
4A Rice
4A Riley
4A Rooks
4A Rush
4A Russell
4A Saline
5A Scott
4A Sedgwick
4A Seward
4A Shawnee
5A Sheridan
5A Sherman
5A Smith
4A Stafford
4A Stanton
4A Stevens
4A Sumner
5A Thomas
4A Trego
4A Wabaunsee
5A Wallace
4A Washington
5A Wichita
4A Wilson
4A Woodson
4A Wyandotte
KENTUCKY
4A (all)
LOUISIANA
2A Acadia*
2A Allen*
2A Ascension*
2A Assumption*
2A Avoyelles*
2A Beauregard*
3A Bienville*
3A Bossier*
3A Caddo*
2A Calcasieu*
3A Caldwell*
2A Cameron*
3A Catahoula*
3A Claiborne*
3A Concordia*
3A De Soto*
2A East Baton Rouge*
3A East Carroll
2A East Feliciana*
2A Evangeline*
3A Franklin*
3A Grant*
2A Iberia*
2A Iberville*
3A Jackson*
2A Jefferson*
2A Jefferson Davis*
2A Lafayette*
2A Lafourche*
3A La Salle*
3A Lincoln*
2A Livingston*
3A Madison*
3A Morehouse
3A Natchitoches*
2A Orleans*
3A Ouachita*
2A Plaquemines*
2A Pointe Coupee*
2A Rapides*
3A Red River*
3A Richland*
3A Sabine*
2A St. Bernard*
2A St. Charles*
2A St. Helena*
2A St. James*
2A St. John the Baptist*
2A St. Landry*
2A St. Martin*
2A St. Mary*
2A St. Tammany*
2A Tangipahoa*
3A Tensas*
2A Terrebonne*
3A Union*
2A Vermilion*
3A Vernon*

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
LOUISIANA *(continued)*
2A Washington*
3A Webster*
2A West Baton Rouge*
3A West Carroll
2A West Feliciana*
3A Winn*
MAINE
6A Androscoggin
7 Aroostook
6A Cumberland
6A Franklin
6A Hancock
6A Kennebec
6A Knox
6A Lincoln
6A Oxford
6A Penobscot
6A Piscataquis
6A Sagadahoc
6A Somerset
6A Waldo
6A Washington
6A York
MARYLAND
5A Allegany
4A Anne Arundel
4A Baltimore
4A Baltimore (city)
4A Calvert
4A Caroline
4A Carroll
4A Cecil
4A Charles
4A Dorchester
4A Frederick
5A Garrett
4A Harford
4A Howard
4A Kent
4A Montgomery
4A Prince George's
4A Queen Anne's
4A Somerset
4A St. Mary's
4A Talbot
4A Washington
4A Wicomico
4A Worcester
MASSACHUSETTS
5A (all)
MICHIGAN
6A Alcona
6A Alger
5A Allegan
6A Alpena
6A Antrim
6A Arenac
6A Baraga
5A Barry
5A Bay
6A Benzie
5A Berrien
5A Branch
5A Calhoun
5A Cass
6A Charlevoix
6A Cheboygan
6A Chippewa
6A Clare
5A Clinton
6A Crawford
6A Delta
6A Dickinson
5A Eaton
6A Emmet
5A Genesee
6A Gladwin
6A Gogebic
6A Grand Traverse
5A Gratiot
5A Hillsdale
6A Houghton
5A Huron
5A Ingham
5A Ionia
6A Iosco
6A Iron
6A Isabella

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MICHIGAN *(continued)*
5A Jackson
5A Kalamazoo
6A Kalkaska
5A Kent
7 Keweenaw
6A Lake
5A Lapeer
6A Leelanau
5A Lenawee
5A Livingston
6A Luce
6A Mackinac
5A Macomb
6A Manistee
7 Marquette
6A Mason
6A Mecosta
6A Menominee
5A Midland
6A Missaukee
5A Monroe
5A Montcalm
6A Montmorency
5A Muskegon
6A Newaygo
5A Oakland
6A Oceana
6A Ogemaw
6A Ontonagon
6A Osceola
6A Oscoda
6A Otsego
5A Ottawa
6A Presque Isle
6A Roscommon
5A Saginaw
5A Sanilac
6A Schoolcraft
5A Shiawassee
5A St. Clair
5A St. Joseph
5A Tuscola
5A Van Buren
5A Washtenaw
5A Wayne
6A Wexford
MINNESOTA
7 Aitkin
6A Anoka
6A Becker
7 Beltrami
6A Benton
6A Big Stone
6A Blue Earth
6A Brown
7 Carlton
6A Carver
7 Cass
6A Chippewa
6A Chisago
6A Clay
7 Clearwater
7 Cook
6A Cottonwood
7 Crow Wing
6A Dakota
6A Dodge
6A Douglas
6A Faribault
5A Fillmore
6A Freeborn
6A Goodhue
6A Grant
6A Hennepin
5A Houston
7 Hubbard
6A Isanti
7 Itasca
6A Jackson
6A Kanabec
6A Kandiyohi
7 Kittson
7 Koochiching
6A Lac qui Parle
7 Lake
7 Lake of the Woods
6A Le Sueur
6A Lincoln

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MINNESOTA *(continued)*
6A Lyon
7 Mahnomen
7 Marshall
6A Martin
6A McLeod
6A Meeker
6A Mille Lacs
6A Morrison
6A Mower
6A Murray
6A Nicollet
6A Nobles
7 Norman
6A Olmsted
6A Otter Tail
7 Pennington
7 Pine
6A Pipestone
7 Polk
6A Pope
6A Ramsey
7 Red Lake
6A Redwood
6A Renville
6A Rice
6A Rock
7 Roseau
6A Scott
6A Sherburne
6A Sibley
6A Stearns
6A Steele
6A Stevens
7 St. Louis
6A Swift
6A Todd
6A Traverse
6A Wabasha
7 Wadena
6A Waseca
6A Washington
6A Watonwan
6A Wilkin
5A Winona
6A Wright
6A Yellow Medicine
MISSISSIPPI
3A Adams*
3A Alcorn
3A Amite*
3A Attala
3A Benton
3A Bolivar
3A Calhoun
3A Carroll
3A Chickasaw
3A Choctaw
3A Claiborne*
3A Clarke
3A Clay
3A Coahoma
3A Copiah*
3A Covington*
3A DeSoto
3A Forrest*
3A Franklin*
2A George*
3A Greene*
3A Grenada
2A Hancock*
2A Harrison*
3A Hinds*
3A Holmes
3A Humphreys
3A Issaquena
3A Itawamba
2A Jackson*
3A Jasper
3A Jefferson*
3A Jefferson Davis*
3A Jones*
3A Kemper
3A Lafayette
3A Lamar*
3A Lauderdale
3A Lawrence*
3A Leake
3A Lee

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MISSISSIPPI *(continued)*
3A Leflore
3A Lincoln*
3A Lowndes
3A Madison
3A Marion*
3A Marshall
3A Monroe
3A Montgomery
3A Neshoba
3A Newton
3A Noxubee
3A Oktibbeha
3A Panola
2A Pearl River*
3A Perry*
3A Pike*
3A Pontotoc
3A Prentiss
3A Quitman
3A Rankin*
3A Scott
3A Sharkey
3A Simpson*
3A Smith*
2A Stone*
3A Sunflower
3A Tallahatchie
3A Tate
3A Tippah
3A Tishomingo
3A Tunica
3A Union
3A Walthall*
3A Warren*
3A Washington
3A Wayne*
3A Webster
3A Wilkinson*
3A Winston
3A Yalobusha
3A Yazoo
MISSOURI
5A Adair
5A Andrew
5A Atchison
4A Audrain
4A Barry
4A Barton
4A Bates
4A Benton
4A Bollinger
4A Boone
4A Buchanan
4A Butler
4A Caldwell
4A Callaway
4A Camden
4A Cape Girardeau
4A Carroll
4A Carter
4A Cass
4A Cedar
4A Chariton
4A Christian
5A Clark
4A Clay
4A Clinton
4A Cole
4A Cooper
4A Crawford
4A Dade
4A Dallas
5A Daviess
5A DeKalb
4A Dent
4A Douglas
3A Dunklin
4A Franklin
4A Gasconade
5A Gentry
4A Greene
5A Grundy
5A Harrison
4A Henry
4A Hickory
5A Holt
4A Howard
4A Howell

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MISSOURI *(continued)*
4A Iron
4A Jackson
4A Jasper
4A Jefferson
4A Johnson
5A Knox
4A Laclede
4A Lafayette
4A Lawrence
5A Lewis
4A Lincoln
5A Linn
5A Livingston
5A Macon
4A Madison
4A Maries
5A Marion
4A McDonald
5A Mercer
4A Miller
4A Mississippi
4A Moniteau
4A Monroe
4A Montgomery
4A Morgan
4A New Madrid
4A Newton
5A Nodaway
4A Oregon
4A Osage
4A Ozark
3A Pemiscot
4A Perry
4A Pettis
4A Phelps
5A Pike
4A Platte
4A Polk
4A Pulaski
5A Putnam
5A Ralls
4A Randolph
4A Ray
4A Reynolds
4A Ripley
4A Saline
5A Schuyler
5A Scotland
4A Scott
4A Shannon
5A Shelby
4A St. Charles
4A St. Clair
4A St. Francois
4A St. Louis
4A St. Louis (city)
4A Ste. Genevieve
4A Stoddard
4A Stone
5A Sullivan
4A Taney
4A Texas
4A Vernon
4A Warren
4A Washington
4A Wayne
4A Webster
5A Worth
4A Wright
MONTANA
6B (all)
NEBRASKA
5A (all)
NEVADA
4B Carson City (city)
5B Churchill
3B Clark
4B Douglas
5B Elko
4B Esmeralda
5B Eureka
5B Humboldt
5B Lander
4B Lincoln
4B Lyon
4B Mineral
4B Nye
5B Pershing

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NEVADA *(continued)*
5B Storey
5B Washoe
5B White Pine
NEW HAMPSHIRE
6A Belknap
6A Carroll
5A Cheshire
6A Coos
6A Grafton
5A Hillsborough
5A Merrimack
5A Rockingham
5A Strafford
6A Sullivan
NEW JERSEY
4A Atlantic
5A Bergen
4A Burlington
4A Camden
4A Cape May
4A Cumberland
4A Essex
4A Gloucester
4A Hudson
5A Hunterdon
4A Mercer
4A Middlesex
4A Monmouth
5A Morris
4A Ocean
5A Passaic
4A Salem
5A Somerset
5A Sussex
4A Union
5A Warren
NEW MEXICO
4B Bernalillo
4B Catron
3B Chaves
4B Cibola
5B Colfax
4B Curry
4B DeBaca
3B Doña Ana
3B Eddy
4B Grant
4B Guadalupe
5B Harding
3B Hidalgo
3B Lea
4B Lincoln
5B Los Alamos
3B Luna
5B McKinley
5B Mora
3B Otero
4B Quay
5B Rio Arriba
4B Roosevelt
5B Sandoval
5B San Juan
5B San Miguel
5B Santa Fe
3B Sierra
4B Socorro
5B Taos
5B Torrance
4B Union
4B Valencia
NEW YORK
5A Albany
5A Allegany
4A Bronx
5A Broome
5A Cattaraugus
5A Cayuga
5A Chautauqua
5A Chemung
6A Chenango
6A Clinton
5A Columbia
5A Cortland
6A Delaware
5A Dutchess
5A Erie
6A Essex
6A Franklin

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NEW YORK *(continued)*
6A Fulton
5A Genesee
5A Greene
6A Hamilton
6A Herkimer
6A Jefferson
4A Kings
6A Lewis
5A Livingston
6A Madison
5A Monroe
6A Montgomery
4A Nassau
4A New York
5A Niagara
6A Oneida
5A Onondaga
5A Ontario
5A Orange
5A Orleans
5A Oswego
6A Otsego
5A Putnam
4A Queens
5A Rensselaer
4A Richmond
5A Rockland
5A Saratoga
5A Schenectady
5A Schoharie
5A Schuyler
5A Seneca
5A Steuben
6A St. Lawrence
4A Suffolk
6A Sullivan
5A Tioga
5A Tompkins
6A Ulster
6A Warren
5A Washington
5A Wayne
4A Westchester
5A Wyoming
5A Yates
NORTH CAROLINA
3A Alamance
3A Alexander
5A Alleghany
3A Anson
5A Ashe
5A Avery
3A Beaufort
3A Bertie
3A Bladen
3A Brunswick*
4A Buncombe
4A Burke
3A Cabarrus
4A Caldwell
3A Camden
3A Carteret*
3A Caswell
3A Catawba
3A Chatham
3A Cherokee
3A Chowan
3A Clay
3A Cleveland
3A Columbus*
3A Craven
3A Cumberland
3A Currituck
3A Dare
3A Davidson
3A Davie
3A Duplin
3A Durham
3A Edgecombe
3A Forsyth
3A Franklin
3A Gaston
3A Gates
4A Graham
3A Granville
3A Greene
3A Guilford
3A Halifax

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NORTH CAROLINA *(continued)*
3A Harnett
4A Haywood
4A Henderson
3A Hertford
3A Hoke
3A Hyde
3A Iredell
4A Jackson
3A Johnston
3A Jones
3A Lee
3A Lenoir
3A Lincoln
4A Macon
4A Madison
3A Martin
4A McDowell
3A Mecklenburg
4A Mitchell
3A Montgomery
3A Moore
3A Nash
3A New Hanover*
3A Northampton
3A Onslow*
3A Orange
3A Pamlico
3A Pasquotank
3A Pender*
3A Perquimans
3A Person
3A Pitt
3A Polk
3A Randolph
3A Richmond
3A Robeson
3A Rockingham
3A Rowan
3A Rutherford
3A Sampson
3A Scotland
3A Stanly
4A Stokes
4A Surry
4A Swain
4A Transylvania
3A Tyrrell
3A Union
3A Vance
3A Wake
3A Warren
3A Washington
5A Watauga
3A Wayne
3A Wilkes
3A Wilson
4A Yadkin
5A Yancey
NORTH DAKOTA
6A Adams
6A Barnes
7 Benson
6A Billings
7 Bottineau
6A Bowman
7 Burke
6A Burleigh
6A Cass
7 Cavalier
6A Dickey
7 Divide
6A Dunn
6A Eddy
6A Emmons
6A Foster
6A Golden Valley
7 Grand Forks
6A Grant
6A Griggs
6A Hettinger
6A Kidder
6A LaMoure
6A Logan
7 McHenry
6A McIntosh
6A McKenzie
6A McLean
6A Mercer

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NORTH DAKOTA *(continued)*
6A Morton
6A Mountrail
7 Nelson
6A Oliver
7 Pembina
7 Pierce
7 Ramsey
6A Ransom
7 Renville
6A Richland
7 Rolette
6A Sargent
6A Sheridan
6A Sioux
6A Slope
6A Stark
6A Steele
6A Stutsman
7 Towner
6A Traill
7 Walsh
7 Ward
6A Wells
6A Williams
OHIO
4A Adams
5A Allen
5A Ashland
5A Ashtabula
4A Athens
5A Auglaize
5A Belmont
4A Brown
4A Butler
5A Carroll
5A Champaign
5A Clark
4A Clermont
4A Clinton
5A Columbiana
5A Coshocton
5A Crawford
5A Cuyahoga
5A Darke
5A Defiance
5A Delaware
5A Erie
5A Fairfield
4A Fayette
4A Franklin
5A Fulton
4A Gallia
5A Geauga
4A Greene
5A Guernsey
4A Hamilton
5A Hancock
5A Hardin
5A Harrison
5A Henry
4A Highland
4A Hocking
5A Holmes
5A Huron
4A Jackson
5A Jefferson
5A Knox
5A Lake
4A Lawrence
5A Licking
5A Logan
5A Lorain
5A Lucas
4A Madison
5A Mahoning
5A Marion
5A Medina
4A Meigs
5A Mercer
5A Miami
5A Monroe
5A Montgomery
5A Morgan
5A Morrow
5A Muskingum
5A Noble
5A Ottawa
5A Paulding

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
OHIO *(continued)*
5A Perry
4A Pickaway
4A Pike
5A Portage
5A Preble
5A Putnam
5A Richland
4A Ross
5A Sandusky
4A Scioto
5A Seneca
5A Shelby
5A Stark
5A Summit
5A Trumbull
5A Tuscarawas
5A Union
5A Van Wert
4A Vinton
4A Warren
4A Washington
5A Wayne
5A Williams
5A Wood
5A Wyandot
OKLAHOMA
3A Adair
4A Alfalfa
3A Atoka
4B Beaver
3A Beckham
3A Blaine
3A Bryan
3A Caddo
3A Canadian
3A Carter
3A Cherokee
3A Choctaw
4B Cimarron
3A Cleveland
3A Coal
3A Comanche
3A Cotton
4A Craig
3A Creek
3A Custer
4A Delaware
3A Dewey
4A Ellis
4A Garfield
3A Garvin
3A Grady
4A Grant
3A Greer
3A Harmon
4A Harper
3A Haskell
3A Hughes
3A Jackson
3A Jefferson
3A Johnston
4A Kay
3A Kingfisher
3A Kiowa
3A Latimer
3A Le Flore
3A Lincoln
3A Logan
3A Love
4A Major
3A Marshall
3A Mayes
3A McClain
3A McCurtain
3A McIntosh
3A Murray
3A Muskogee
3A Noble
4A Nowata
3A Okfuskee
3A Oklahoma
3A Okmulgee
4A Osage
4A Ottawa
3A Pawnee
3A Payne
3A Pittsburg
3A Pontotoc

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
OKLAHOMA *(continued)*
3A Pottawatomie
3A Pushmataha
3A Roger Mills
3A Rogers
3A Seminole
3A Sequoyah
3A Stephens
4B Texas
3A Tillman
3A Tulsa
3A Wagoner
4A Washington
3A Washita
4A Woods
4A Woodward
OREGON
5B Baker
4C Benton
4C Clackamas
4C Clatsop
4C Columbia
4C Coos
5B Crook
4C Curry
5B Deschutes
4C Douglas
5B Gilliam
5B Grant
5B Harney
5B Hood River
4C Jackson
5B Jefferson
4C Josephine
5B Klamath
5B Lake
4C Lane
4C Lincoln
4C Linn
5B Malheur
4C Marion
5B Morrow
4C Multnomah
4C Polk
5B Sherman
4C Tillamook
5B Umatilla
5B Union
5B Wallowa
5B Wasco
4C Washington
5B Wheeler
4C Yamhill
PENNSYLVANIA
4A Adams
5A Allegheny
5A Armstrong
5A Beaver
5A Bedford
4A Berks
5A Blair
5A Bradford
4A Bucks
5A Butler
5A Cambria
5A Cameron
5A Carbon
5A Centre
4A Chester
5A Clarion
5A Clearfield
5A Clinton
5A Columbia
5A Crawford
4A Cumberland
4A Dauphin
4A Delaware
5A Elk
5A Erie
5A Fayette
5A Forest
4A Franklin
5A Fulton
5A Greene
5A Huntingdon
5A Indiana
5A Jefferson
5A Juniata
5A Lackawanna

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
PENNSYLVANIA *(continued)*
4A Lancaster
5A Lawrence
4A Lebanon
5A Lehigh
5A Luzerne
5A Lycoming
5A McKean
5A Mercer
5A Mifflin
5A Monroe
4A Montgomery
5A Montour
5A Northampton
5A Northumberland
4A Perry
4A Philadelphia
5A Pike
5A Potter
5A Schuylkill
5A Snyder
5A Somerset
5A Sullivan
5A Susquehanna
5A Tioga
5A Union
5A Venango
5A Warren
5A Washington
5A Wayne
5A Westmoreland
5A Wyoming
4A York
RHODE ISLAND
5A (all)
SOUTH CAROLINA
3A Abbeville
3A Aiken
3A Allendale*
3A Anderson
3A Bamberg*
3A Barnwell*
2A Beaufort*
3A Berkeley*
3A Calhoun
3A Charleston*
3A Cherokee
3A Chester
3A Chesterfield
3A Clarendon
3A Colleton*
3A Darlington
3A Dillon
3A Dorchester*
3A Edgefield
3A Fairfield
3A Florence
3A Georgetown*
3A Greenville
3A Greenwood
3A Hampton*
3A Horry*
2A Jasper*
3A Kershaw
3A Lancaster
3A Laurens
3A Lee
3A Lexington
3A Marion
3A Marlboro
3A McCormick
3A Newberry
3A Oconee
3A Orangeburg
3A Pickens
3A Richland
3A Saluda
3A Spartanburg
3A Sumter
3A Union
3A Williamsburg
3A York
SOUTH DAKOTA
6A Aurora
6A Beadle
5A Bennett
5A Bon Homme
6A Brookings
6A Brown

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
SOUTH DAKOTA *(continued)*
5A Brule
6A Buffalo
6A Butte
6A Campbell
5A Charles Mix
6A Clark
5A Clay
6A Codington
6A Corson
6A Custer
6A Davison
6A Day
6A Deuel
6A Dewey
5A Douglas
6A Edmunds
6A Fall River
6A Faulk
6A Grant
5A Gregory
5A Haakon
6A Hamlin
6A Hand
6A Hanson
6A Harding
6A Hughes
5A Hutchinson
6A Hyde
5A Jackson
6A Jerauld
5A Jones
6A Kingsbury
6A Lake
6A Lawrence
6A Lincoln
5A Lyman
6A Marshall
6A McCook
6A McPherson
6A Meade
5A Mellette
6A Miner
6A Minnehaha
6A Moody
6A Pennington
6A Perkins
6A Potter
6A Roberts
6A Sanborn
6A Shannon
6A Spink
5A Stanley
6A Sully
5A Todd
5A Tripp
6A Turner
5A Union
6A Walworth
5A Yankton
6A Ziebach
TENNESSEE
4A Anderson
3A Bedford
4A Benton
4A Bledsoe
4A Blount
4A Bradley
4A Campbell
4A Cannon
4A Carroll
4A Carter
4A Cheatham
3A Chester
4A Claiborne
4A Clay
4A Cocke
3A Coffee
3A Crockett
4A Cumberland
3A Davidson
3A Decatur
4A DeKalb
4A Dickson
3A Dyer
3A Fayette
4A Fentress
3A Franklin
3A Gibson

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TENNESSEE *(continued)*
3A Giles
4A Grainger
4A Greene
3A Grundy
4A Hamblen
3A Hamilton
4A Hancock
3A Hardeman
3A Hardin
4A Hawkins
3A Haywood
3A Henderson
4A Henry
3A Hickman
4A Houston
4A Humphreys
4A Jackson
4A Jefferson
4A Johnson
4A Knox
4A Lake
3A Lauderdale
3A Lawrence
3A Lewis
3A Lincoln
4A Loudon
4A Macon
3A Madison
3A Marion
3A Marshall
3A Maury
4A McMinn
3A McNairy
4A Meigs
4A Monroe
4A Montgomery
3A Moore
4A Morgan
4A Obion
4A Overton
3A Perry
4A Pickett
4A Polk
4A Putnam
4A Rhea
4A Roane
4A Robertson
3A Rutherford
4A Scott
4A Sequatchie
4A Sevier
3A Shelby
4A Smith
4A Stewart
4A Sullivan
4A Sumner
3A Tipton
4A Trousdale
4A Unicoi
4A Union
4A Van Buren
4A Warren
4A Washington
3A Wayne
4A Weakley
4A White
3A Williamson
4A Wilson
TEXAS
2A Anderson*
3B Andrews
2A Angelina*
2A Aransas*
3A Archer
4B Armstrong
2A Atascosa*
2A Austin*
4B Bailey
2B Bandera
2A Bastrop*
3B Baylor
2A Bee*
2A Bell*
2A Bexar*
3A Blanco*
3B Borden
2A Bosque*
3A Bowie*

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
2A Brazoria*
2A Brazos*
3B Brewster
4B Briscoe
2A Brooks*
3A Brown*
2A Burleson*
3A Burnet*
2A Caldwell*
2A Calhoun*
3B Callahan
1A Cameron*
3A Camp*
4B Carson
3A Cass*
4B Castro
2A Chambers*
2A Cherokee*
3B Childress
3A Clay
4B Cochran
3B Coke
3B Coleman
3A Collin*
3B Collingsworth
2A Colorado*
2A Comal*
3A Comanche*
3B Concho
3A Cooke
2A Coryell*
3B Cottle
3B Crane
3B Crockett
3B Crosby
3B Culberson
4B Dallam
2A Dallas*
3B Dawson
4B Deaf Smith
3A Delta
3A Denton*
2A DeWitt*
3B Dickens
2B Dimmit
4B Donley
2A Duval*
3A Eastland
3B Ector
2B Edwards
2A Ellis*
3B El Paso
3A Erath*
2A Falls*
3A Fannin
2A Fayette*
3B Fisher
4B Floyd
3B Foard
2A Fort Bend*
3A Franklin*
2A Freestone*
2B Frio
3B Gaines
2A Galveston*
3B Garza
3A Gillespie*
3B Glasscock
2A Goliad*
2A Gonzales*
4B Gray
3A Grayson
3A Gregg*
2A Grimes*
2A Guadalupe*
4B Hale
3B Hall
3A Hamilton*
4B Hansford
3B Hardeman
2A Hardin*
2A Harris*
3A Harrison*
4B Hartley
3B Haskell
2A Hays*
3B Hemphill
3A Henderson*

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
1A Hidalgo*
2A Hill*
4B Hockley
3A Hood*
3A Hopkins*
2A Houston*
3B Howard
3B Hudspeth
3A Hunt*
4B Hutchinson
3B Irion
3A Jack
2A Jackson*
2A Jasper*
3B Jeff Davis
2A Jefferson*
2A Jim Hogg*
2A Jim Wells*
2A Johnson*
3B Jones
2A Karnes*
3A Kaufman*
3A Kendall*
2A Kenedy*
3B Kent
3B Kerr
3B Kimble
3B King
2B Kinney
2A Kleberg*
3B Knox
3A Lamar*
4B Lamb
3A Lampasas*
2B La Salle
2A Lavaca*
2A Lee*
2A Leon*
2A Liberty*
2A Limestone*
4B Lipscomb
2A Live Oak*
3A Llano*
3B Loving
3B Lubbock
3B Lynn
2A Madison*
3A Marion*
3B Martin
3B Mason
2A Matagorda*
2B Maverick
3B McCulloch
2A McLennan*
2A McMullen*
2B Medina
3B Menard
3B Midland
2A Milam*
3A Mills*
3B Mitchell
3A Montague
2A Montgomery*
4B Moore
3A Morris*
3B Motley
3A Nacogdoches*
2A Navarro*
2A Newton*
3B Nolan
2A Nueces*
4B Ochiltree
4B Oldham
2A Orange*
3A Palo Pinto*
3A Panola*
3A Parker*
4B Parmer
3B Pecos
2A Polk*
4B Potter
3B Presidio
3A Rains*
4B Randall
3B Reagan
2B Real
3A Red River*
3B Reeves

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
2A Refugio*
4B Roberts
2A Robertson*
3A Rockwall*
3B Runnels
3A Rusk*
3A Sabine*
3A San Augustine*
2A San Jacinto*
2A San Patricio*
3A San Saba*
3B Schleicher
3B Scurry
3B Shackelford
3A Shelby*
4B Sherman
3A Smith*
3A Somervell*
2A Starr*
3A Stephens
3B Sterling
3B Stonewall
3B Sutton
4B Swisher
2A Tarrant*
3B Taylor
3B Terrell
3B Terry
3B Throckmorton
3A Titus*
3B Tom Green
2A Travis*
2A Trinity*
2A Tyler*
3A Upshur*
3B Upton
2B Uvalde
2B Val Verde
3A Van Zandt*
2A Victoria*
2A Walker*
2A Waller*
3B Ward
2A Washington*
2B Webb
2A Wharton*
3B Wheeler
3A Wichita
3B Wilbarger
1A Willacy*
2A Williamson*
2A Wilson*
3B Winkler
3A Wise
3A Wood*
4B Yoakum
3A Young
2B Zapata
2B Zavala
UTAH
5B Beaver
5B Box Elder
5B Cache
5B Carbon
6B Daggett
5B Davis
6B Duchesne
5B Emery
5B Garfield
5B Grand
5B Iron
5B Juab
5B Kane
5B Millard
6B Morgan
5B Piute
6B Rich
5B Salt Lake
5B San Juan
5B Sanpete
5B Sevier
6B Summit
5B Tooele
6B Uintah
5B Utah
6B Wasatch
3B Washington
5B Wayne

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
UTAH *(continued)*
5B Weber
VERMONT
6A (all)
VIRGINIA
4A (all except as follows:)
5A Alleghany
5A Bath
3A Brunswick
3A Chesapeake
5A Clifton Forge
5A Covington
3A Emporia
3A Franklin
3A Greensville
3A Halifax
3A Hampton
5A Highland
3A Isle of Wight
3A Mecklenburg
3A Newport News
3A Norfolk
3A Pittsylvania
3A Portsmouth
3A South Boston
3A Southampton
3A Suffolk
3A Surry
3A Sussex
3A Virginia Beach
WASHINGTON
5B Adams
5B Asotin
5B Benton
5B Chelan
5C Clallam
4C Clark
5B Columbia
4C Cowlitz
5B Douglas
6B Ferry
5B Franklin
5B Garfield
5B Grant
4C Grays Harbor
5C Island
4C Jefferson
4C King
5C Kitsap
5B Kittitas
5B Klickitat
4C Lewis
5B Lincoln
4C Mason
5B Okanogan
4C Pacific
6B Pend Oreille
4C Pierce
5C San Juan
4C Skagit
5B Skamania
4C Snohomish
5B Spokane
6B Stevens
4C Thurston
4C Wahkiakum
5B Walla Walla
4C Whatcom
5B Whitman
5B Yakima
WEST VIRGINIA
5A Barbour
4A Berkeley
4A Boone
4A Braxton
5A Brooke
4A Cabell
4A Calhoun
4A Clay
4A Doddridge
4A Fayette
4A Gilmer
5A Grant
4A Greenbrier
5A Hampshire
5A Hancock
5A Hardy
5A Harrison
4A Jackson

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
WEST VIRGINIA *(continued)*
4A Jefferson
4A Kanawha
4A Lewis
4A Lincoln
4A Logan
5A Marion
5A Marshall
4A Mason
4A McDowell
4A Mercer
5A Mineral
4A Mingo
5A Monongalia
4A Monroe
4A Morgan
4A Nicholas
5A Ohio
5A Pendleton
4A Pleasants
5A Pocahontas
5A Preston
4A Putnam
4A Raleigh
5A Randolph
4A Ritchie
4A Roane
4A Summers
5A Taylor
5A Tucker
4A Tyler
4A Upshur
4A Wayne
4A Webster
5A Wetzel
4A Wirt
4A Wood
4A Wyoming
WISCONSIN
5A Adams
6A Ashland
6A Barron
6A Bayfield
6A Brown
6A Buffalo
6A Burnett
5A Calumet
6A Chippewa
6A Clark
5A Columbia
5A Crawford
5A Dane
5A Dodge
6A Door
6A Douglas
6A Dunn
6A Eau Claire
6A Florence
5A Fond du Lac
6A Forest
5A Grant
5A Green
5A Green Lake
5A Iowa
6A Iron
6A Jackson
5A Jefferson
5A Juneau
5A Kenosha
6A Kewaunee
5A La Crosse
5A Lafayette
6A Langlade
6A Lincoln
6A Manitowoc
6A Marathon
6A Marinette
6A Marquette
6A Menominee
5A Milwaukee
5A Monroe
6A Oconto
6A Oneida
5A Outagamie
5A Ozaukee
6A Pepin
6A Pierce
6A Polk
6A Portage

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
WISCONSIN *(continued)*
6A Price
5A Racine
5A Richland
5A Rock
6A Rusk
5A Sauk
6A Sawyer
6A Shawano
6A Sheboygan
6A St. Croix
6A Taylor
6A Trempealeau
5A Vernon
6A Vilas
5A Walworth
6A Washburn
5A Washington
5A Waukesha
6A Waupaca
5A Waushara
5A Winnebago
6A Wood
WYOMING
6B Albany
6B Big Horn
6B Campbell
6B Carbon
6B Converse
6B Crook
6B Fremont
5B Goshen
6B Hot Springs
6B Johnson
5B Laramie
7 Lincoln
6B Natrona
6B Niobrara
6B Park
5B Platte
6B Sheridan
7 Sublette
6B Sweetwater
7 Teton
6B Uinta
6B Washakie
6B Weston
US TERRITORIES
AMERICAN SAMOA
1A (all)*
GUAM
1A (all)*
NORTHERN MARIANA ISLANDS
1A (all)*
PUERTO RICO
1A (all except as follows:)*
2B Barraquitas
2B Cayey
VIRGIN ISLANDS
1A (all)*

a. Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a Warm Humid location.

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R301.3 Climate zone definitions. To determine the climate zones for locations not listed in this code, use the following information to determine climate zone numbers and letters in accordance with Items 1 through 5.

1. Determine the thermal climate zone, 0 through 8, from Table R301.3 using the heating (HDD) and cooling degree-days (CDD) for the location.
2. Determine the moisture zone (Marine, Dry or Humid) in accordance with Items 2.1 through 2.3.
    2.1. If monthly average temperature and precipitation data are available, use the Marine, Dry and Humid definitions to determine the moisture zone (C, B or A).
    2.2. If annual average temperature information (including degree-days) and annual precipitation (i.e., annual mean) are available, use Items 2.2.1 through 2.2.3 to determine the moisture zone. If the moisture zone is not Marine, then use the Dry definition to determine whether Dry or Humid.
        2.2.1. If thermal climate zone is 3 and CDD50°F ≤ 4,500 (CDD10°C ≤ 2500), climate zone is Marine (3C).
        2.2.2. If thermal climate zone is 4 and CDD50°F ≤ 2,700 (CDD10°C ≤ 1500), climate zone is Marine (4C).
        2.2.3. If thermal climate zone is 5 and CDD50°F ≤ 1,800 (CDD10°C ≤ 1000), climate zone is Marine (5C).
    2.3. If only degree-day information is available, use Items 2.3.1 through 2.3.3 to determine the moisture zone. If the moisture zone is not Marine, then it is not possible to assign Humid or Dry moisture zone for this location.
        2.3.1. If thermal climate zone is 3 and CDD50°F ≤ 4,500 (CDD10°C ≤ 2500), climate zone is Marine (3C).
        2.3.2. If thermal climate zone is 4 and CDD50°F ≤ 2,700 (CDD10°C ≤ 1500), climate zone is Marine (4C).
        2.3.3. If thermal climate zone is 5 and CDD50°F ≤ 1,800 (CDD10°C ≤ 1000), climate zone is Marine (5C).
3. Marine (C) Zone definition: Locations meeting all the criteria in Items 3.1 through 3.4.
    3.1. Mean temperature of coldest month between 27°F (-3°C) and 65°F (18°C).
    3.2. Warmest month mean < 72°F (22°C).
    3.3. Not fewer than four months with mean temperatures over 50°F (10°C).
    3.4. Dry season in summer. The month with the heaviest precipitation in the cold season has at least three times as much precipitation as the month with the least precipitation in the rest of the year. The cold season is October through March in the Northern Hemisphere and April through September in the Southern Hemisphere.
4. Dry (B) definition: Locations meeting the criteria in Items 4.1 through 4.4.
    4.1. Not Marine (C).
    4.2. If 70 percent or more of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-1.

    $$P < 0.44 \times (T - 7)$$
    $$[P < 20.0 \times (T + 14) \text{ in SI units}]$$
    (Equation 3-1)

    where:
    P = Annual precipitation, inches (mm).
    T = Annual mean temperature, °F (°C).

    4.3. If between 30 and 70 percent of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-2.

    $$P < 0.44 \times (T - 19.5)$$
    $$[P < 20.0 \times (T + 7) \text{ in SI units}]$$
    (Equation 3-2)

    where:
    P = Annual precipitation, inches (mm).
    T = Annual mean temperature, °F (°C).

    4.4. If 30 percent or less of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-3.

    $$P < 0.44 \times (T - 32)$$
    $$[P < 20.0 \times T \text{ in SI units}]$$
    (Equation 3-3)

    where:
    P = Annual precipitation, inches (mm).
    T = Annual mean temperature, °F (°C).
5. Humid (A) definition: Locations that are not Marine (C) or Dry (B).

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TABLE R301.3
THERMAL CLIMATE ZONE DEFINITIONS

ZONE NUMBER	THERMAL CRITERIA	
	IP Units	SI Units
0	10,800 < CDD50°F	6000 < CDD10°C
1	9,000 < CDD50°F < 10,800	5000 < CDD10°C < 6000
2	6,300 < CDD50°F ≤ 9,000	3500 < CDD10°C ≤ 5000
3	CDD50°F ≤ 6,300 AND HDD65°F ≤ 3,600	CDD10°C < 3500 AND HDD18°C ≤ 2000
4	CDD50°F ≤ 6,300 AND 3,600 < HDD65°F ≤ 5,400	CDD10°C < 3500 AND 2000 < HDD18°C ≤ 3000
5	CDD50°F < 6,300 AND 5,400 < HDD65°F ≤ 7,200	CDD10°C < 3500 AND 3000 < HDD18°C ≤ 4000
6	7,200 < HDD65°F ≤ 9,000	4000 < HDD18°C ≤ 5000
7	9,000 < HDD65°F ≤ 12,600	5000 < HDD18°C ≤ 7000
8	12,600 < HDD65°F	7000 < HDD18°C

For SI: °C = [(°F) - 32]/1.8.

R301.4 Tropical climate region. The tropical region shall be defined as:

1. Hawaii, Puerto Rico, Guam, American Samoa, U.S. Virgin Islands, Commonwealth of Northern Mariana Islands; and
2. Islands in the area between the Tropic of Cancer and the Tropic of Capricorn.

SECTION R302
DESIGN CONDITIONS

R302.1 Interior design conditions. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.

SECTION R303
MATERIALS, SYSTEMS AND EQUIPMENT

R303.1 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

R303.1.1 Building thermal envelope insulation. An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation that is 12 inches (305 mm) or greater in width. Alternatively, the insulation installers shall provide a certification that indicates the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown-in or sprayed fiberglass and cellulose insulation, the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be indicated on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and the *R*-value of the installed thickness shall be indicated on the certification. For insulated siding, the *R*-value shall be on a label on the product's package and shall be indicated on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

Exception: For roof insulation installed above the deck, the *R*-value shall be labeled as required by the material standards specified in Table 1508.2 of the *International Building Code* or Table R906.2 of the *International Residential Code*, as applicable.

R303.1.1.1 Blown-in or sprayed roof and ceiling insulation. The thickness of blown-in or sprayed fiberglass and cellulose roof and ceiling insulation shall be written in inches (mm) on markers that are installed at not less than one for every 300 square feet (28 m^2) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers not less than 1 inch (25 mm) in height. Each marker shall face the attic access opening. The thickness and installed *R*-value of sprayed polyurethane foam insulation shall be indicated on the certification provided by the insulation installer.

R303.1.2 Insulation mark installation. Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable at inspection. For insulation materials that are installed without an observable manufacturer's *R*-value mark, such as blown or draped products, an insulation certificate complying with Section R303.1.1 shall be left immediately after installation by the installer, in a conspicuous location within the building, to certify the installed *R*-value of the insulation material.

R303.1.3 Fenestration product rating. *U*-factors of fenestration products such as windows, doors and *skylights* shall be determined in accordance with NFRC 100.

Exception: Where required, garage door *U*-factors shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

U-factors shall be determined by an accredited, independent laboratory, and labeled and certified by the manufacturer.

Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Table R303.1.3(1) or Table R303.1.3(2). The *solar heat gain coefficient* (SHGC) and *visible transmittance* (VT) of glazed fenestration products such as windows, glazed doors and *skylights* shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC or VT shall be assigned a default SHGC or VT from Table R303.1.3(3).

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TABLE R303.1.3(1)
DEFAULT GLAZED WINDOW, GLASS DOOR AND SKYLIGHT *U*-FACTORS

FRAME TYPE	WINDOW AND GLASS DOOR		SKYLIGHT	
	Single pane	Double pane	Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

TABLE R303.1.3(2)
DEFAULT OPAQUE DOOR *U*-FACTORS

DOOR TYPE	OPAQUE *U*-FACTOR
Uninsulated Metal	1.20
Insulated Metal	0.60
Wood	0.50
Insulated, nonmetal edge, not exceeding 45% glazing, any glazing double pane	0.35

TABLE R303.1.3(3)
DEFAULT GLAZED FENESTRATION SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

R303.1.4 Insulation product rating. The thermal resistance, *R*-value, of insulation shall be determined in accordance with Part 460 of US-FTC CFR Title 16 in units of h × ft^2 × °F/Btu at a mean temperature of 75°F (24°C).

R303.1.4.1 Insulated siding. The thermal resistance, *R*-value, of insulated siding shall be determined in accordance with ASTM C1363. Installation for testing shall be in accordance with the manufacturer's instructions.

R303.1.5 Air-impermeable insulation. Insulation having an air permeability not greater than 0.004 cubic feet per minute per square foot [0.002 L/(s × m^2)] under pressure differential of 0.3 inch water gauge (75 Pa) when tested in accordance with ASTM E2178 shall be determined air-impermeable insulation.

R303.2 Installation. Materials, systems and equipment shall be installed in accordance with the manufacturer's instructions and the *International Building Code* or the *International Residential Code*, as applicable.

R303.2.1 Protection of exposed foundation insulation. Insulation applied to the exterior of *basement walls*, crawl space walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend not less than 6 inches (153 mm) below grade.

R303.3 Maintenance information. Maintenance instructions shall be furnished for equipment and systems that require preventive maintenance. Required regular maintenance actions shall be clearly stated and incorporated on a readily visible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.

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CHAPTER 4 [RE]
RESIDENTIAL ENERGY EFFICIENCY

User note:

About this chapter: *Chapter 4 presents the paths and options for compliance with the energy efficiency provisions. Chapter 4 contains energy efficiency provisions for the building envelope, mechanical and water heating systems, lighting and additional efficiency requirements. A performance alternative, energy rating alternative, and tropical regional alternative are also provided to allow for energy code compliance other than by the prescriptive method.*

SECTION R401
GENERAL

R401.1 Scope. This chapter applies to residential buildings.

R401.2 Application. Residential buildings shall comply with Section R401.2.5 and either Sections R401.2.1, R401.2.2, R401.2.3 or R401.2.4.

Exception: Additions, *alterations*, repairs and changes of occupancy to existing buildings complying with Chapter 5.

R401.2.1 Prescriptive Compliance Option. The Prescriptive Compliance Option requires compliance with Sections R401 through R404.

R401.2.2 Total Building Performance Option. The Total Building Performance Option requires compliance with Section R405.

R401.2.3 Energy Rating Index Option. The Energy Rating Index (ERI) Option requires compliance with Section R406.

R401.2.4 Tropical Climate Region Option. The Tropical Climate Region Option requires compliance with Section R407.

R401.2.5 Additional energy efficiency. This section establishes additional requirements applicable to all compliance approaches to achieve additional energy efficiency.

1. For buildings complying with Section R401.2.1, one of the additional efficiency package options shall be installed according to Section R408.2.
2. For buildings complying with Section R401.2.2, the building shall meet one of the following:
   2.1. One of the additional efficiency package options in Section R408.2 shall be installed without including such measures in the proposed design under Section R405; or
   2.2. The proposed design of the building under Section R405.2 shall have an annual energy cost that is less than or equal to 95 percent of the annual energy cost of the standard reference design.
3. For buildings complying with the Energy Rating Index alternative Section R401.2.3, the Energy Rating Index value shall be at least 5 percent less than the Energy Rating Index target specified in Table R406.5.

The option selected for compliance shall be identified in the certificate required by Section R401.3. *

R401.3 Certificate. A permanent certificate shall be completed by the builder or other *approved* party and posted on a wall in the space where the furnace is located, a utility room or an *approved* location inside the *building*. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory *label*, service disconnect *label* or other required labels. The certificate shall indicate the following:

1. The predominant *R*-values of insulation installed in or on ceilings, roofs, walls, foundation components such as slabs, *basement walls*, *crawl space walls* and floors and ducts outside *conditioned spaces.*
2. *U*-factors of fenestration and the *solar heat gain coefficient* (SHGC) of fenestration. Where there is more than one value for any component of the building envelope, the certificate shall indicate both the value covering the largest area and the area weighted average value if available.
3. The results from any required duct system and building envelope air leakage testing performed on the building.
4. The types, sizes and efficiencies of heating, cooling and service water-heating equipment. Where a gas-fired unvented room heater, electric furnace or baseboard electric heater is installed in the residence, the certificate shall indicate “gas-fired unvented room heater,” “electric furnace” or “baseboard electric heater,” as appropriate. An efficiency shall not be indicated for gas-fired unvented room heaters, electric furnaces and electric baseboard heaters.
5. Where on-site *photovoltaic panel* systems have been installed, the array capacity, inverter efficiency, panel tilt and orientation shall be noted on the certificate.
6. For buildings where an Energy Rating Index score is determined in accordance with Section R406, the Energy Rating Index score, both with and without

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any on-site generation, shall be listed on the certificate.

7. The code edition under which the structure was permitted, and the compliance path used.

SECTION R402
BUILDING THERMAL ENVELOPE

R402.1 General. The *building thermal envelope* shall comply with the requirements of Sections R402.1.1 through R402.1.5.

Exceptions:

1. The following low-energy *buildings*, or portions thereof, separated from the remainder of the building by *building thermal envelope* assemblies complying with this section shall be exempt from the *building thermal envelope* provisions of Section R402.
   1.1. Those with a peak design rate of energy usage less than 3.4 Btu/h × ft^2 (10.7 W/m^2) or 1.0 watt/ft^2 of floor area for space-conditioning purposes.
   1.2. Those that do not contain *conditioned space*.
2. Log homes designed in accordance with ICC 400.

R402.1.1 Vapor retarder. Wall assemblies in the *building thermal envelope* shall comply with the vapor retarder requirements of Section R702.7 of the *International Residential Code* or Section 1404.3 of the *International Building Code*, as applicable.

R402.1.2 Insulation and fenestration criteria. The *building thermal envelope* shall meet the requirements of Table R402.1.2, based on the *climate zone* specified in Chapter 3. Assemblies shall have a *U*-factor equal to or less than that specified in Table R402.1.2. Fenestration shall have a *U*-factor and glazed fenestration SHGC equal to or less than that specified in Table R402.1.2.

R402.1.3 *R*-value alternative. Assemblies with *R*-value of insulation materials equal to or greater than that specified in Table R402.1.3 shall be an alternative to the *U*-factor in Table R402.1.2

R402.1.4 *R*-value computation. Cavity insulation alone shall be used to determine compliance with the cavity insulation *R*-value requirements in Table R402.1.3. Where cavity insulation is installed in multiple layers, the *R*-values of the cavity insulation layers shall be summed to determine compliance with the cavity insulation *R*-value requirements. The manufacturer's settled *R*-value shall be used for blown-in insulation. Continuous insulation (ci) alone shall be used to determine compliance with the continuous insulation *R*-value requirements in Table R402.1.3. Where continuous insulation is installed in multiple layers, the *R*-values of the continuous insulation layers shall be summed to determine compliance with the continuous insulation *R*-value requirements. Cavity insulation *R*-values shall not be used to determine compliance with the continuous insulation *R*-value requirements in Table R402.1.3. Computed *R*-values shall not include an

TABLE R402.1.2
MAXIMUM ASSEMBLY *U*-FACTORS[a] AND FENESTRATION REQUIREMENTS

CLIMATE ZONE	FENESTRATION *U*-FACTOR[f]	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC[d, e]	CEILING *U*-FACTOR	WOOD FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
0	0.50	0.75	0.25	0.035	0.084	0.197	0.064	0.360	0.477
1	0.50	0.75	0.25	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.25	0.026	0.084	0.165	0.064	0.360	0.477
3	0.30	0.55	0.25	0.026	0.060	0.098	0.047	0.091[c]	0.136
4 except Marine	0.30	0.55	0.40	0.024	0.045	0.098	0.047	0.059	0.065
5 and Marine 4	0.30	0.55	0.40	0.024	0.045	0.082	0.033	0.050	0.055
6	0.30	0.55	NR	0.024	0.045	0.060	0.033	0.050	0.055
7 and 8	0.30	0.55	NR	0.024	0.045	0.057	0.028	0.050	0.055

For SI: 1 foot = 304.8 mm.

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.

b. Mass walls shall be in accordance with Section R402.2.5. Where more than half the insulation is on the interior, the mass wall *U*-factors shall not exceed 0.17 in Climate Zones 0 and 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.087 in Climate Zone 4 except Marine, 0.065 in Climate Zone 5 and Marine 4, and 0.057 in Climate Zones 6 through 8.

c. In Warm Humid locations as defined by Figure R301.1 and Table R301.1, the basement wall *U*-factor shall not exceed 0.360.

d. The SHGC column applies to all glazed fenestration.
Exception: In Climate Zones 0 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.

e. There are no SHGC requirements in the Marine Zone.

f. A maximum *U*-factor of 0.32 shall apply in Marine Climate Zone 4 and Climate Zones 5 through 8 to vertical fenestration products installed in buildings located either:
1. Above 4,000 feet in elevation above sea level, or
2. In windborne debris regions where protection of openings is required by Section R301.2.1.2 of the *International Residential Code*.

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TABLE R402.1.3
INSULATION MINIMUM *R*-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b, i]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE[g]	MASS WALL *R*-VALUE[h]	FLOOR *R*-VALUE	BASEMENT[c,g] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c,g] WALL *R*-VALUE
0	NR	0.75	0.25	30	13 or 0&10ci	3/4	13	0	0	0
1	NR	0.75	0.25	30	13 or 0&10ci	3/4	13	0	0	0
2	0.40	0.65	0.25	49	13 or 0&10ci	4/6	13	0	0	0
3	.30	0.55	0.25	49	20 or 13&5ci[h] or 0&15ci[h]	8/13	19	5ci or 13[f]	10ci, 2 ft	5ci or 13[f]
4 except Marine	.30	0.55	0.40	60	30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]	8/13	19	10ci or 13	10ci, 4 ft	10ci or 13
5 and Marine 4	0.30[i]	0.55	0.40	60	30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]	13/17	30	15ci or 19 or 13&5ci	10ci, 4 ft	15ci or 19 or 13&5ci
6	0.30[i]	0.55	NR	60	30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]	15/20	30	15ci or 19 or 13&5ci	10ci, 4 ft	15ci or 19 or 13&5ci
7 and 8	0.30[i]	0.55	NR	60	30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]	19/21	38	15ci or 19 or 13&5ci	10ci, 4 ft	15ci or 19 or 13&5ci

For SI: 1 foot = 304.8 mm.
NR = Not Required.

ci = continuous insulation.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed *R*-value of the insulation shall be not less than the *R*-value specified in the table.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
Exception: In Climate Zones 0 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.

c. "5ci or 13" means R-5 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "10ci or 13" means R-10 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "15ci or 19 or 13&5ci" means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation on the interior side of the wall; or R-13 cavity insulation on the interior of the wall in addition to R-5 continuous insulation on the interior or exterior surface of the wall.

d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation *R*-value for slabs. as indicated in the table. The slab-edge insulation for heated slabs shall not be required to extend below the slab.

e. There are no SHGC requirements in the Marine Zone.

f. Basement wall insulation is not required in Warm Humid locations as defined by Figure R301.1 and Table R301.1.

g. The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, "13&5" means R-13 cavity insulation plus R-5 continuous insulation.

h. Mass walls shall be in accordance with Section R402.2.5. The second *R*-value applies where more than half of the insulation is on the interior of the mass wall.

i. A maximum *U*-factor of 0.32 shall apply in Climate Zones 3 through 8 to vertical fenestration products installed in buildings located either:
1. Above 4,000 feet in elevation, or
2. In windborne debris regions where protection of openings is required by Section R301.2.1.2 of the *International Residential Code*.

R-value for other building materials or air films. Where insulated siding is used for the purpose of complying with the continuous insulation requirements of Table R402.1.3, the manufacturer's labeled *R*-value for the insulated siding shall be reduced by R-0.6.

R402.1.5 Total UA alternative. Where the total *building thermal envelope* UA, the sum of *U*-factor times assembly area, is less than or equal to the total UA resulting from multiplying the *U*-factors in Table R402.1.2 by the same assembly area as in the proposed *building*, the *building* shall be considered to be in compliance with Table R402.1.2. The UA calculation shall be performed using a method consistent with the ASHRAE *Handbook of Fundamentals* and shall include the thermal bridging effects of framing materials. In addition to UA compliance, the

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SHGC requirements of Table R402.1.2 and the maximum fenestration *U*-factors of Section R402.5 shall be met.

R402.2 Specific insulation requirements. In addition to the requirements of Section R402.1, insulation shall meet the specific requirements of Sections R402.2.1 through R402.2.12.

R402.2.1 Ceilings with attics. Where Section R402.1.3 requires R-49 insulation in the ceiling or attic, installing R-38 over 100 percent of the ceiling or attic area requiring insulation shall satisfy the requirement for R-49 insulation wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. Where Section R402.1.3 requires R-60 insulation in the ceiling or attic, installing R-49 over 100 percent of the ceiling or attic area requiring insulation shall satisfy the requirement for R-60 insulation wherever the full height of uncompressed R-49 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the insulation and fenestration criteria in Section R402.1.2 and the Total UA alternative in Section R402.1.5.

R402.2.2 Ceilings without attics. Where Section R402.1.3 requires insulation *R*-values greater than R-30 in the interstitial space above a ceiling and below the structural roof deck, and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation *R*-value for such roof/ceiling assemblies shall be R-30. Insulation shall extend over the top of the wall plate to the outer edge of such plate and shall not be compressed. This reduction of insulation from the requirements of Section R402.1.3 shall be limited to 500 square feet (46 m^2) or 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the Total UA alternative in Section R402.1.5.

R402.2.3 Eave baffle. For air-permeable insulation in vented attics, a baffle shall be installed adjacent to soffit and eave vents. Baffles shall maintain a net free area opening equal to or greater than the size of the vent. The baffle shall extend over the top of the attic insulation. The baffle shall be permitted to be any solid material. The baffle shall be installed to the outer edge of the *exterior wall* top plate so as to provide maximum space for attic insulation coverage over the top plate. Where soffit venting is not continuous, baffles shall be installed continuously to prevent ventilation air in the eave soffit from bypassing the baffle.

R402.2.4 Access hatches and doors. Access hatches and doors from conditioned to unconditioned spaces such as attics and crawl spaces shall be insulated to the same *R*-value required by Table R402.1.3 for the wall or ceiling in which they are installed.

Exceptions:

1. Vertical doors providing access from conditioned spaces to unconditioned spaces that comply with the fenestration requirements of Table R402.1.3 based on the applicable climate zone specified in Chapter 3.
2. Horizontal pull-down, stair-type access hatches in ceiling assemblies that provide access from conditioned to unconditioned spaces in Climate Zones 0 through 4 shall not be required to comply with the insulation level of the surrounding surfaces provided the hatch meets all of the following:
   2.1. The average *U*-factor of the hatch shall be less than or equal to U-0.10 or have an average insulation *R*-value of R-10 or greater.
   2.2. Not less than 75 percent of the panel area shall have an insulation *R*-value of R-13 or greater.
   2.3. The net area of the framed opening shall be less than or equal to 13.5 square feet (1.25 m^2).
   2.4. The perimeter of the hatch edge shall be weatherstripped.

The reduction shall not apply to the total UA alternative in Section R402.1.5.

R402.2.4.1 Access hatches and door insulation installation and retention. Vertical or horizontal access hatches and doors from *conditioned spaces* to *unconditioned spaces* such as attics and crawl spaces shall be weatherstripped. Access that prevents damaging or compressing the insulation shall be provided to all equipment. Where loose-fill insulation is installed, a wood-framed or equivalent baffle, retainer, or dam shall be installed to prevent loose-fill insulation from spilling into living space from higher to lower sections of the attic and from attics covering conditioned spaces to unconditioned spaces. The baffle or retainer shall provide a permanent means of maintaining the installed *R*-value of the loose-fill insulation.

R402.2.5 Mass walls. Mass walls where used as a component of the *building thermal envelope* shall be one of the following:

1. Above-ground walls of concrete block, concrete, insulated concrete form, masonry cavity, brick but not brick veneer, adobe, compressed earth block, rammed earth, solid timber, mass timber or solid logs.
2. Any wall having a heat capacity greater than or equal to 6 Btu/ft^2 × °F (123 kJ/m^2 × K).

R402.2.6 Steel-frame ceilings, walls and floors. Steel-frame ceilings, walls, and floors shall comply with the insulation requirements of Table R402.2.6 or the *U*-factor requirements of Table R402.1.2. The calculation of the *U*-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method.

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TABLE R402.2.6
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION *R*-VALUES

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL-FRAME EQUIVALENT *R*-VALUE[a]
Steel Truss Ceilings[b]	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
Steel Joist Ceilings[b]	
R-30	R-38 in 2 × 4 or 2 × 6 or 2 × 8 R-49 in any framing
R-38	R-49 in 2 × 4 or 2 × 6 or 2 × 8 or 2 × 10
Steel-frame Wall, 16 inches on center	
R-13	R-13 + 4.2 or R-21 + 2.8 or R-0 + 9.3 or R-15 + 3.8 or R-21 + 3.1
R-13 + 5	R-0 + 15 or R-13 + 9 or R-15 + 8.5 or R-19 + 8 or R-21 + 7
R-13 + 10	R-0 + 20 or R-13 + 15 or R-15 + 14 or R-19 + 13 or R-21 + 13
R-20	R-0 + 14.0 or R-13 + 8.9 or R-15 + 8.5 or R-19 + 7.8 or R-21 + 7.5
R-20 + 5	R-13 + 12.7 or R-15 + 12.3 or R-19 + 11.6 or R-21 + 11.3 or R-25 + 10.9
R-21	R-0 + 14.6 or R-13 + 9.5 or R-15 + 9.1 or R-19 + 8.4 or R-21 + 8.1 or R-25 + 7.7
Steel-frame Wall, 24 inches on center	
R-13	R-0 + 9.3 or R-13 + 3.0 or R-15 + 2.4
R-13 + 5	R-0 + 15 or R-13 + 7.5 or R-15 + 7 or R-19 + 6 or R-21 + 6
R-13 + 10	R-0 + 20 or R-13 + 13 or R-15 + 12 or R-19 + 11 or R-21 + 11
R-20	R-0 + 14.0 or R-13 + 7.7 or R-15 + 7.1 or R-19 + 6.3 or R-21 + 5.9
R-20 + 5	R-13 + 11.5 or R-15 + 10.9 or R-19 + 10.1 or R-21 + 9.7 or R-25 + 9.1
R-21	R-0 + 14.6 or R-13 + 8.3 or R-15 + 7.7 or R-19 + 6.9 or R-21 + 6.5 or R-25 + 5.9
Steel Joist Floor	
R-13	R-19 in 2 × 6, or R-19 + 6 in 2 × 8 or 2 × 10
R-19	R-19 + 6 in 2 × 6, or R-19 + 12 in 2 × 8 or 2 × 10

a. The first value is cavity insulation *R*-value; the second value is continuous insulation *R*-value. Therefore, for example, "R-30 + 3" means R-30 cavity insulation plus R-3 continuous insulation.

b. Insulation exceeding the height of the framing shall cover the framing.

R402.2.7 Floors. Floor *cavity insulation* shall comply with one of the following:

1. Installation shall be installed to maintain permanent contact with the underside of the subfloor decking in accordance with manufacturer instructions to maintain required *R*-value or readily fill the available cavity space.
2. Floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing separating the cavity and the unconditioned space below. Insulation shall extend from the bottom to the top of all perimeter floor framing members and the framing members shall be air sealed.
3. A combination of cavity and continuous insulation shall be installed so that the cavity insulation is in contact with the top side of the continuous insulation that is installed on the underside of the floor framing separating the cavity and the unconditioned space below. The combined *R*-value of the cavity and continuous insulation shall equal the required *R*-value for floors. Insulation shall extend from the bottom to the top of all perimeter floor framing members and the framing members shall be air sealed.

R402.2.8 Basement walls. Basement walls shall be insulated in accordance with Table R402.1.3.

Exception: Basement walls associated with unconditioned basements where all of the following requirements are met:

1. The floor overhead, including the underside stairway stringer leading to the basement, is insulated in accordance with Section R402.1.3 and applicable provisions of Sections R402.2 and R402.2.7.
2. There are no uninsulated duct, domestic hot water, or hydronic heating surfaces exposed to the basement.
3. There are no HVAC supply or return diffusers serving the basement.
4. The walls surrounding the stairway and adjacent to conditioned space are insulated in accordance with Section R402.1.3 and applicable provisions of Section R402.2.
5. The door(s) leading to the basement from conditioned spaces are insulated in accordance with Section R402.1.3 and applicable provisions of Section R402.2, and weatherstripped in accordance with Section R402.4.
6. The building thermal envelope separating the basement from adjacent conditioned spaces complies with Section R402.4.

R402.2.8.1 Basement wall insulation installation. Where *basement walls* are insulated, the insulation shall be installed from the top of the *basement wall* down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less.

R402.2.9 Slab-on-grade floors. Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table R402.1.3.

Exception: Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation.

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R402.2.9.1 Slab-on-grade floor insulation installation. Where installed, the insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table R402.1.3 or the distance of the proposed design, as applicable, by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by not less than 10 inches (254 mm) of soil. The top edge of the insulation installed between the *exterior wall* and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the *exterior wall*.

R402.2.10 Crawl space walls. Crawl space walls shall be insulated in accordance with Table R402.1.3.

Exception: Crawl space walls associated with a crawl space that is vented to the outdoors and the floor overhead is insulated in accordance with Table R402.1.3 and Section R402.2.7.

R402.2.10.1 Crawl space wall insulation installations. Where crawl space wall insulation is installed, it shall be permanently fastened to the wall and shall extend downward from the floor to the finished grade elevation and then vertically or horizontally for not less than an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder in accordance with the *International Building Code* or *International Residential Code*, as applicable. Joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend not less than 6 inches (153 mm) up stem walls and shall be attached to the stem walls.

R402.2.11 Masonry veneer. Insulation shall not be required on the horizontal portion of a foundation that supports a masonry veneer.

R402.2.12 Sunroom and heated garage insulation. *Sunrooms* enclosing *conditioned space* and heated garages shall meet the insulation requirements of this code.

Exception: For *sunrooms* and heated garages provided *thermal isolation*, and enclosed *conditioned space*, the following exceptions to the insulation requirements of this code shall apply:

1. The minimum ceiling insulation *R*-values shall be R-19 in *Climate Zones* 0 through 4 and R-24 in *Climate Zones* 5 through 8.
2. The minimum wall insulation *R*-value shall be R-13 in all *climate zones*. Walls separating a *sunroom* or heated garage with *thermal isolation* from *conditioned space* shall comply with the *building thermal envelope* requirements of this code.

R402.3 Fenestration. In addition to the requirements of Section R402, fenestration shall comply with Sections R402.3.1 through R402.3.5.

R402.3.1 *U*-factor. An area-weighted average of fenestration products shall be permitted to satisfy the *U*-factor requirements.

R402.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50-percent glazed shall be permitted to satisfy the SHGC requirements.

Dynamic glazing shall be permitted to satisfy the SHGC requirements of Table R402.1.2 provided that the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the *dynamic glazing* is automatically controlled to modulate the amount of solar gain into the space in multiple steps. *Dynamic glazing* shall be considered separately from other fenestration, and area-weighted averaging with other fenestration that is not dynamic glazing shall be prohibited.

Exception: Dynamic glazing shall not be required to comply with this section where both the lower and higher labeled SHGC comply with the requirements of Table R402.1.2.

R402.3.3 Glazed fenestration exemption. Not greater than 15 square feet (1.4 m^2) of glazed fenestration per *dwelling unit* shall be exempt from the *U*-factor and SHGC requirements in Section R402.1.2. This exemption shall not apply to the Total UA alternative in Section R402.1.5.

R402.3.4 Opaque door exemption. One side-hinged opaque door assembly not greater than 24 square feet (2.22 m^2) in area shall be exempt from the *U*-factor requirement in Section R402.1.2. This exemption shall not apply to the Total UA alternative in Section R402.1.5.

R402.3.5 Sunroom and heated garage fenestration. *Sunrooms* and heated garages enclosing *conditioned space* shall comply with the fenestration requirements of this code.

Exception: In Climate Zones 2 through 8, for *sunrooms* and heated garages with *thermal isolation* and enclosing *conditioned space*, the fenestration *U*-factor shall not exceed 0.45 and the skylight *U*-factor shall not exceed 0.70.

New fenestration separating a *sunroom* or heated garage with *thermal isolation* from *conditioned space* shall comply with the *building thermal envelope* requirements of this code.

R402.4 Air leakage. The *building thermal envelope* shall be constructed to limit air leakage in accordance with the requirements of Sections R402.4.1 through R402.4.5.

R402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections R402.4.1.1 through R402.4.1.3. The sealing methods between

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dissimilar materials shall allow for differential expansion and contraction.

R402.4.1.1 Installation. The components of the *building thermal envelope* as indicated in Table R402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria indicated in Table R402.4.1.1, as applicable to the method of construction. Where required by the *code official,* an *approved* third party shall inspect all components and verify compliance.

TABLE R402.4.1.1
AIR BARRIER, AIR SEALING AND INSULATION INSTALLATION[a]

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling or soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance, *R*-value, of not less than R-3 per inch. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between framing and skylights, and the jambs of windows and doors, shall be sealed.	—
Rim joists	Rim joists shall include an exterior air barrier.[b] The junctions of the rim board to the sill plate and the rim board and the subfloor shall be air sealed.	Rim joists shall be insulated so that the insulation maintains permanent contact with the exterior rim board.[b]
Floors, including cantilevered floors and floors above garages	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking. Alternatively, floor framing cavity insulation shall be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extending from the bottom to the top of all perimeter floor framing members.
Basement crawl space and slab foundations	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder/air barrier in accordance with Section R402.2.10. Penetrations through concrete foundation walls and slabs shall be air sealed. Class 1 vapor retarders shall not be used as an air barrier on below-grade walls and shall be installed in accordance with Section R702.7 of the *International Residential Code*.	Crawl space insulation, where provided instead of floor insulation, shall be installed in accordance with Section R402.2.10. Conditioned basement foundation wall insulation shall be installed in accordance with Section R402.2.8.1. Slab-on-grade floor insulation shall be installed in accordance with Section R402.2.10.
Shafts, penetrations	Duct and flue shafts to exterior or unconditioned space shall be sealed. Utility penetrations of the air barrier shall be caulked, gasketed or otherwise sealed and shall allow for expansion, contraction of materials and mechanical vibration.	Insulation shall be fitted tightly around utilities passing through shafts and penetrations in the building thermal envelope to maintain required *R*-value.
Narrow cavities	Narrow cavities of 1 inch or less that are not able to be insulated shall be air sealed.	Batts to be installed in narrow cavities shall be cut to fit or narrow cavities shall be filled with insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	Insulated portions of the garage separation assembly shall be installed in accordance with Sections R303 and R402.2.7.

(continued)

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TABLE R402.4.1.1—continued
AIR BARRIER, AIR SEALING AND INSULATION INSTALLATION[a]

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be air sealed in accordance with Section R402.4.5.	Recessed light fixtures installed in the building thermal envelope shall be airtight and IC rated, and shall be buried or surrounded with insulation.
Plumbing, wiring or other obstructions	All holes created by wiring, plumbing or other obstructions in the air barrier assembly shall be air sealed.	Insulation shall be installed to fill the available space and surround wiring, plumbing, or other obstructions, unless the required *R*-value can be met by installing insulation and air barrier systems completely to the exterior side of the obstructions.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate the wall from the shower or tub.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical and communication boxes. Alternatively, air-sealed boxes shall be installed.	—
HVAC register boots	HVAC supply and return register boots that penetrate building thermal envelope shall be sealed to the subfloor, wall covering or ceiling penetrated by the boot.	—
Concealed sprinklers	Where required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	—

a. Inspection of log walls shall be in accordance with the provisions of ICC 400.
b. Air barrier and insulation full enclosure is not required in unconditioned/ventilated attic spaces and at rim joists.

R402.4.1.2 Testing. The *building* or *dwelling unit* shall be tested for air leakage. The maximum air leakage rate for any *building* or *dwelling unit* under any compliance path shall not exceed 5.0 air changes per hour or 0.28 cubic feet per minute (CFM) per square foot [0.0079 $m^3/(s \times m^2)$] of dwelling unit enclosure area. Testing shall be conducted in accordance with ANSI/RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope* have been sealed.

Exception: For heated, attached private garages and heated, detached private garages accessory to one- and two-family dwellings and townhouses not more than three stories above *grade plane* in height, building envelope tightness and insulation installation shall be considered acceptable where the items in Table R402.4.1.1, applicable to the method of construction, are field verified. Where required by the code official, an *approved* third party independent from the installer shall inspect both air barrier and insulation installation criteria. Heated, attached private garage space and heated, detached private garage space shall be thermally isolated from all other habitable, *conditioned spaces* in accordance with Sections R402.2.12 and R402.3.5, as applicable.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.
3. Interior doors, where installed at the time of the test, shall be open.
4. Exterior or interior terminations for continuous ventilation systems shall be sealed.
5. Heating and cooling systems, where installed at the time of the test, shall be turned off.
6. Supply and return registers, where installed at the time of the test, shall be fully open.

Exception: When testing individual *dwelling units*, an air leakage rate not exceeding 0.30 cubic feet per minute per square foot [0.008 $m^3/(s \times m^2)$] of the dwelling unit enclosure area, tested in accordance with ANSI/RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported at a pressure of

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0.2 inch w.g. (50 Pa), shall be permitted in all climate zones for:

1. Attached single and multiple-family building *dwelling units*.
2. Buildings or *dwelling units* that are 1,500 square feet (139.4 m^2) or smaller.

Mechanical ventilation shall be provided in accordance with Section M1505 of the *International Residential Code* or Section 403.3.2 of the *International Mechanical Code*, as applicable, or with other *approved* means of ventilation.

R402.4.1.3 Leakage rate. When complying with Section R401.2.1, the building or dwelling unit shall have an air leakage rate not exceeding 5.0 air changes per hour in Climate Zones 0, 1 and 2, and 3.0 air changes per hour in Climate Zones 3 through 8, when tested in accordance with Section R402.4.1.2.

R402.4.2 Fireplaces. New wood-burning fireplaces shall have tight-fitting flue dampers or doors, and outdoor combustion air. Where using tight-fitting doors on factory-built fireplaces *listed* and *labeled* in accordance with UL 127, the doors shall be tested and *listed* for the fireplace.

R402.4.3 Fenestration air leakage. Windows, *skylights* and sliding glass doors shall have an air infiltration rate of not greater than 0.3 cfm per square foot (1.5 L/s/m^2), and for swinging doors, not greater than 0.5 cfm per square foot (2.6 L/s/m^2), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and *listed* and *labeled* by the manufacturer.

Exception: Site-built windows, *skylights* and doors.

R402.4.4 Rooms containing fuel-burning appliances. In Climate Zones 3 through 8, where open combustion air ducts provide combustion air to open combustion fuel-burning appliances, the appliances and combustion air opening shall be located outside the *building thermal envelope* or enclosed in a room that is isolated from inside the thermal envelope. Such rooms shall be sealed and insulated in accordance with the envelope requirements of Table R402.1.3, where the walls, floors and ceilings shall meet a minimum of the *basement wall R*-value requirement. The door into the room shall be fully gasketed and any water lines and ducts in the room insulated in accordance with Section R403. The combustion air duct shall be insulated where it passes through *conditioned space* to an *R*-value of not less than R-8.

Exceptions:

1. Direct vent appliances with both intake and exhaust pipes installed continuous to the outside.
2. Fireplaces and stoves complying with Section R402.4.2 and Section R1006 of the *International Residential Code*.

R402.4.5 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be sealed to limit air leakage between conditioned and *unconditioned spaces*. Recessed luminaires shall be IC-rated and *labeled* as having an air leakage rate of not greater than 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E283 at a pressure differential of 1.57 psf (75 Pa). Recessed luminaires shall be sealed with a gasket or caulked between the housing and the interior wall or ceiling covering.

R402.4.6 Electrical and communication outlet boxes (air-sealed boxes). Electrical and communication outlet boxes installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. Electrical and communication outlet boxes shall be tested in accordance with NEMA OS 4, *Requirements for Air-Sealed Boxes for Electrical and Communication Applications*, and shall have an air leakage rate of not greater than 2.0 cubic feet per minute (0.944 L/s) at a pressure differential of 1.57 psf (75 Pa). Electrical and communication outlet boxes shall be marked "NEMA OS 4" or "OS 4" in accordance with NEMA OS 4. Electrical and communication outlet boxes shall be installed per the manufacturer's instructions and with any supplied components required to achieve compliance with NEMA OS 4.

R402.5 Maximum fenestration U-factor and SHGC. The area-weighted average maximum fenestration *U*-factor permitted using tradeoffs from Section R402.1.5 or R405 shall be 0.48 in Climate Zones 4 and 5 and 0.40 in Climate Zones 6 through 8 for vertical fenestration, and 0.75 in Climate Zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using tradeoffs from Section R405 in *Climate Zones* 0 through 3 shall be 0.40.

Exception: The maximum *U*-factor and solar heat gain coefficient (SHGC) for fenestration shall not be required in storm shelters complying with ICC 500.

SECTION R403
SYSTEMS

R403.1 Controls. Not less than one thermostat shall be provided for each separate heating and cooling system.

R403.1.1 Programmable thermostat. The thermostat controlling the primary heating or cooling system of the *dwelling unit* shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of day and different days of the week. This thermostat shall include the capability to set back or temporarily operate the system to maintain *zone* temperatures of not less than 55°F (13°C) to not greater than 85°F (29°C). The thermostat shall be programmed initially by the manufacturer with a heating temperature setpoint of not greater than 70°F (21°C) and a cooling temperature setpoint of not less than 78°F (26°C).

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R403.1.2 Heat pump supplementary heat. Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.

R403.2 Hot water boiler temperature reset. The manufacturer shall equip each gas, oil and electric boiler (other than a boiler equipped with a tankless domestic water heating coil) with automatic means of adjusting the water temperature supplied by the boiler to ensure incremental change of the inferred heat load will cause an incremental change in the temperature of the water supplied by the boiler. This can be accomplished with outdoor reset, indoor reset or water temperature sensing.

R403.3 Ducts. Ducts and air handlers shall be installed in accordance with Sections R403.3.1 through R403.3.7.

R403.3.1 Ducts located outside conditioned space. Supply and return ducts located outside *conditioned space* shall be insulated to an *R*-value of not less than R-8 for ducts 3 inches (76 mm) in diameter and larger and not less than R-6 for ducts smaller than 3 inches (76 mm) in diameter. Ducts buried beneath a building shall be insulated as required per this section or have an equivalent *thermal distribution efficiency*. Underground ducts utilizing the *thermal distribution efficiency* method shall be listed and *labeled* to indicate the *R*-value equivalency.

R403.3.2 Ducts located in conditioned space. For ductwork to be considered inside a *conditioned space,* it shall comply with one of the following:

1. The duct system shall be located completely within the *continuous air barrier* and within the building thermal envelope.
2. Ductwork in ventilated attic spaces shall be buried within ceiling insulation in accordance with Section R403.3.3 and all of the following conditions shall exist:
   2.1. The air handler is located completely within the *continuous air barrier* and within the *building thermal envelope*.
   2.2. The duct leakage, as measured either by a rough-in test of the ducts or a post-construction total system leakage test to outside the *building thermal envelope* in accordance with Section R403.3.6, is less than or equal to 1.5 cubic feet per minute (42.5 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* served by the duct system.
   2.3. The ceiling insulation *R*-value installed against and above the insulated duct is greater than or equal to the proposed ceiling insulation *R*-value, less the *R*-value of the insulation on the duct.
3. Ductwork in floor cavities located over unconditioned space shall comply with all of the following:
   3.1. A *continuous air barrier* installed between unconditioned space and the duct.
   3.2. Insulation installed in accordance with Section R402.2.7.
   3.3. A minimum R-19 insulation installed in the cavity width separating the duct from unconditioned space.
4. Ductwork located within *exterior walls* of the *building thermal envelope* shall comply with the following:
   4.1. A *continuous air barrier* installed between unconditioned space and the duct.
   4.2. Minimum R-10 insulation installed in the cavity width separating the duct from the outside sheathing.
   4.3. The remainder of the cavity insulation shall be fully insulated to the drywall side.

R403.3.3 Ducts buried within ceiling insulation. Where supply and return air ducts are partially or completely buried in ceiling insulation, such ducts shall comply with all of the following:

1. The supply and return ducts shall have an insulation *R*-value not less than R-8.
2. At all points along each duct, the sum of the ceiling insulation *R*-value against and above the top of the duct, and against and below the bottom of the duct, shall be not less than R-19, excluding the *R*-value of the duct insulation.
3. In Climate Zones 0A, 1A, 2A and 3A, the supply ducts shall be completely buried within ceiling insulation, insulated to an *R*-value of not less than R-13 and in compliance with the vapor retarder requirements of Section 604.11 of the *International Mechanical Code* or Section M1601.4.6 of the *International Residential Code*, as applicable.

   Exception: Sections of the supply duct that are less than 3 feet (914 mm) from the supply outlet shall not be required to comply with these requirements.

R403.3.3.1 Effective *R*-value of deeply buried ducts. Where using the Total Building Performance Compliance Option in accordance with Section R401.2.2, sections of ducts that are installed in accordance with Section R403.3.3, located directly on or within 5.5 inches (140 mm) of the ceiling, surrounded with blown-in attic insulation having an *R*-value of R-30 or greater and located such that the top of the duct is not less than 3.5 inches (89 mm) below the top of the insulation, shall be considered as having an effective duct insulation *R*-value of R-25.

R403.3.4 Sealing. Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with either the *International Mechanical Code* or *International Residential Code*, as applicable.

R403.3.4.1 Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage of

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not greater than 2 percent of the design airflow rate when tested in accordance with ASHRAE 193.

R403.3.5 Duct testing. Ducts shall be pressure tested in accordance with ANSI/RESNET/ICC 380 or ASTM E1554 to determine air leakage by one of the following methods:

1. Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. Registers shall be taped or otherwise sealed during the test.
2. Postconstruction test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test.

A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*.

Exception: A duct air-leakage test shall not be required for ducts serving ventilation systems that are not integrated with ducts serving heating or cooling systems.

R403.3.6 Duct leakage. The total leakage of the ducts, where measured in accordance with Section R403.3.5, shall be as follows:

1. Rough-in test: The total leakage shall be less than or equal to 4.0 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* where the air handler is installed at the time of the test. Where the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3.0 cubic feet per minute (85 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area*.
2. Postconstruction test: Total leakage shall be less than or equal to 4.0 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area*.
3. Test for ducts within thermal envelope: Where all ducts and air handlers are located entirely within the *building thermal envelope*, total leakage shall be less than or equal to 8.0 cubic feet per minute (226.6 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area*.

R403.3.7 Building cavities. *Building* framing cavities shall not be used as ducts or plenums.

R403.4 Mechanical system piping insulation. Mechanical system piping capable of carrying fluids greater than 105°F (41°C) or less than 55°F (13°C) shall be insulated to an *R*-value of not less than R-3.

R403.4.1 Protection of piping insulation. Piping insulation exposed to weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance and wind. The protection shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall be prohibited.

R403.5 Service hot water systems. Energy conservation measures for service hot water systems shall be in accordance with Sections R403.5.1 through R403.5.3.

R403.5.1 Heated water circulation and temperature maintenance systems. Heated water circulation systems shall be in accordance with Section R403.5.1.1. Heat trace temperature maintenance systems shall be in accordance with Section R403.5.1.2. Automatic controls, temperature sensors and pumps shall be in a location with access. Manual controls shall be in a location with *ready access*.

R403.5.1.1 Circulation systems. Heated water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe or a cold water supply pipe. Gravity and thermosyphon circulation systems shall be prohibited. Controls for circulating hot water system pumps shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is no demand for hot water. The controls shall limit the temperature of the water entering the cold water piping to not greater than 104ºF (40ºC).

R403.5.1.1.1 Demand recirculation water systems. Where installed, *demand recirculation water systems* shall have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance, sensing the presence of a user of a fixture or sensing the flow of hot or tempered water to a fixture fitting or appliance.

R403.5.1.2 Heat trace systems. Electric heat trace systems shall comply with IEEE 515.1 or UL 515. Controls for such systems shall automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy.

R403.5.2 Hot water pipe insulation. Insulation for service hot water piping with a thermal resistance, *R*-value, of not less than R-3 shall be applied to the following:

1. Piping $^3/_4$ inch (19.1 mm) and larger in nominal diameter located inside the *conditioned space*.
2. Piping serving more than one dwelling unit.
3. Piping located outside the *conditioned space*.
4. Piping from the water heater to a distribution manifold.
5. Piping located under a floor slab.
6. Buried piping.
7. Supply and return piping in circulation and recirculation systems other than cold water pipe return demand recirculation systems.

R403.5.3 Drain water heat recovery units. Where installed, drain water heat recovery units shall comply

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with CSA B55.2. Drain water heat recovery units shall be tested in accordance with CSA B55.1. Potable water-side pressure loss of drain water heat recovery units shall be less than 3 psi (20.7 kPa) for individual units connected to one or two showers. Potable water-side pressure loss of drain water heat recovery units shall be less than 2 psi (13.8 kPa) for individual units connected to three or more showers.

R403.6 Mechanical ventilation. The *buildings* complying with Section R402.4.1 shall be provided with ventilation that complies with the requirements of Section M1505 of the *International Residential Code* or *International Mechanical Code*, as applicable, or with other *approved* means of *ventilation*. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the *ventilation* system is not operating.

R403.6.1 Heat or energy recovery ventilation. *Dwelling units* shall be provided with a heat recovery or energy recovery ventilation system in Climate Zones 7 and 8. The system shall be balanced with a minimum sensible heat recovery efficiency of 65 percent at 32°F (0°C) at a flow greater than or equal to the design airflow.

R403.6.2 Whole-dwelling mechanical ventilation system fan efficacy. Fans used to provide whole-dwelling mechanical ventilation shall meet the efficacy requirements of Table R403.6.2 at one or more rating points. Fans shall be tested in accordance with HVI 916 and listed. The airflow shall be reported in the product listing or on the label. Fan efficacy shall be reported in the product listing or shall be derived from the input power and airflow values reported in the product listing or on the label. Fan efficacy for fully ducted HRV, ERC, balanced, and in-line fans shall be determined at a static pressure of not less than 0.2 inch w.c. (49.85 Pa). Fan efficacy for ducted range hoods, bathroom and utility room fans shall be determined at a static pressure of not less than 0.1 inch w.c. (24.91 Pa).

TABLE R403.6.2
WHOLE-DWELLING MECHANICAL VENTILATION SYSTEM FAN EFFICACY[a]

FAN LOCATION	AIRFLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)
HRV, ERV	Any	1.2 cfm/watt
In-line supply or exhaust fan	Any	3.8 cfm/watt
Other exhaust fan	< 90	2.8 cfm/watt
Other exhaust fan	≥ 90	3.5 cfm/watt
Air-handler that is integrated to tested and *listed* HVAC equipment	Any	1.2 cfm/watt

For SI: 1 cubic foot per minute = 28.3 L/min.

a. Design outdoor airflow rate/watts of fan used.

R403.6.3 Testing. Mechanical ventilation systems shall be tested and verified to provide the minimum ventilation flow rates required by Section R403.6. Testing shall be performed according to the ventilation *equipment* manufacturer's instructions, or by using a flow hood or box, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals or grilles, outlet terminals or grilles, or in the connected ventilation ducts. Where required by the code official, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.

Exception: Kitchen range hoods that are ducted to the outside with 6-inch (152 mm) or larger duct and not more than one 90-degree (1.57 rad) elbow or equivalent in the duct run.

R403.7 Equipment sizing and efficiency rating. Heating and cooling *equipment* shall be sized in accordance with ACCA Manual S based on *building* loads calculated in accordance with ACCA Manual J or other *approved* heating and cooling calculation methodologies. New or replacement heating and cooling *equipment* shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the *equipment* is installed.

R403.8 Systems serving multiple dwelling units. Systems serving multiple *dwelling units* shall comply with Sections C403 and C404 of the *International Energy Conservation Code*—Commercial Provisions instead of Section R403.

R403.9 Snow melt and ice system controls. Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is greater than 50°F (10°C) and precipitation is not falling, and an automatic or manual control that will allow shutoff when the outdoor temperature is greater than 40°F (4.8°C).

R403.10 Energy consumption of pools and spas. The energy consumption of pools and permanent spas shall be controlled by the requirements in Sections R403.10.1 through R403.10.3.

R403.10.1 Heaters. The electric power to heaters shall be controlled by an on-off switch that is an integral part of the heater mounted on the exterior of the heater in a location with *ready access*, or external to and within 3 feet (914 mm) of the heater. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously burning ignition pilots.

R403.10.2 Time switches. Time switches or other control methods that can automatically turn heaters and pump motors off and on according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Pumps that operate solar- and waste-heat-recovery pool heating systems.

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R403.10.3 Covers. Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other *approved* vapor-retardant means.

Exception: Where more than 75 percent of the energy for heating, computed over an operation season of not fewer than 3 calendar months, is from a heat pump or an on-site renewable energy system, covers or other vapor-retardant means shall not be required.

R403.11 Portable spas. The energy consumption of electric-powered portable spas shall be controlled by the requirements of APSP 14.

R403.12 Residential pools and permanent residential spas. Where installed, the energy consumption of residential swimming pools and permanent residential spas shall be controlled in accordance with the requirements of APSP 15.

SECTION R404
ELECTRICAL POWER AND LIGHTING SYSTEMS

R404.1 Lighting equipment. All permanently installed lighting fixtures, excluding kitchen appliance lighting fixtures, shall contain only high-efficacy lighting sources.

R404.1.1 Exterior lighting. Connected exterior lighting for residential buildings shall comply with Section C405.5.

Exceptions:

1. Detached one- and two- family dwellings.
2. Townhouses.
3. Solar-powered lamps not connected to any electrical service.
4. Luminaires controlled by a motion sensor.
5. Lamps and luminaires that comply with Section R404.1.

R404.1.2 Fuel gas lighting equipment. Fuel gas lighting systems shall not have continuously burning pilot lights.

R404.2 Interior lighting controls. Permanently installed lighting fixtures shall be controlled with either a dimmer, an occupant sensor control or other control that is installed or built into the fixture.

Exception: Lighting controls shall not be required for the following:

1. Bathrooms.
2. Hallways.
3. Exterior lighting fixtures.
4. Lighting designed for safety or security.

R404.3 Exterior lighting controls. Where the total permanently installed exterior lighting power is greater than 30 watts, the permanently installed exterior lighting shall comply with the following:

1. Lighting shall be controlled by a manual on and off switch which permits automatic shut-off actions.

   Exception: Lighting serving multiple *dwelling units*.

2. Lighting shall be automatically shut off when daylight is present and satisfies the lighting needs.
3. Controls that override automatic shut-off actions shall not be allowed unless the override automatically returns automatic control to its normal operation within 24 hours.

SECTION R405
TOTAL BUILDING PERFORMANCE

R405.1 Scope. This section establishes criteria for compliance using total building performance analysis. Such analysis shall include heating, cooling, mechanical ventilation and service water-heating energy only.

R405.2 Performance-based compliance. Compliance based on total building performance requires that a *proposed design* meets all of the following:

1. The requirements of the sections indicated within Table R405.2.
2. The building thermal envelope shall be greater than or equal to levels of efficiency and solar heat gain coefficients in Table R402.1.1 or R402.1.3 of the 2009 *International Energy Conservation Code*.
3. An annual energy cost that is less than or equal to the annual energy cost of the *standard reference design*. Energy prices shall be taken from a source *approved* by the *code official*, such as the Department of Energy, Energy Information Administration's State Energy Data System Prices and Expenditures reports. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.

Exception: The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.

R405.3 Documentation. Documentation of the software used for the performance design and the parameters for the *building* shall be in accordance with Sections R405.3.1 through R405.3.2.2.

R405.3.1 Compliance software tools. Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the *code official.*

R405.3.2 Compliance report. Compliance software tools shall generate a report that documents that the *proposed design* complies with Section R405.3. A compliance report on the *proposed design* shall be submitted with the application for the building permit. Upon completion of the building, a confirmed compliance report based on the confirmed condition of the building shall be submitted to the *code official* before a certificate of occupancy is issued.

Compliance reports shall include information in accordance with Sections R405.3.2.1 and R405.3.2.2.

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TABLE R405.2
REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION[a]	TITLE
General	
R401.2.5	Additional energy efficiency
R401.3	Certificate
Building Thermal Envelope	
R402.1.1	Vapor retarder
R402.2.3	Eave baffle
R402.2.4.1	Access hatches and doors
R402.2.10.1	Crawl space wall insulation installations
R402.4.1.1	Installation
R402.4.1.2	Testing
R402.5	Maximum fenestration *U*-factor and SHGC
Mechanical	
R403.1	Controls
R403.3, including R403.3.1, except Sections R403.3.2, R403.3.3 and R403.3.6	Ducts
R403.4	Mechanical system piping insulation
R403.5.1	Heated water circulation and temperature maintenance systems
R403.5.3	Drain water heat recovery units
R403.6	Mechanical ventilation
R403.7	Equipment sizing and efficiency rating
R403.8	Systems serving multiple dwelling units
R403.9	Snow melt and ice systems
R403.10	Energy consumption of pools and spas
R403.11	Portable spas
R403.12	Residential pools and permanent residential spas
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls

a. Reference to a code section includes all the relative subsections except as indicated in the table.

R405.3.2.1 Compliance report for permit application. A compliance report submitted with the application for building permit shall include the following:

1. Building street address, or other *building site* identification.
2. The name of the individual performing the analysis and generating the compliance report.
3. The name and version of the compliance software tool.
4. Documentation of all inputs entered into the software used to produce the results for the reference design and/or the rated home.
5. A certificate indicating that the proposed design complies with Section R405.3. The certificate shall document the building components' energy specifications that are included in the calculation including: component-level insulation *R*-values or *U*-factors; duct system and building envelope air leakage testing assumptions; and the type and rated efficiencies of proposed heating, cooling, mechanical ventilation and service water-heating equipment to be installed. If on-site renewable energy systems will be installed, the certificate shall report the type and production size of the proposed system.
6. Where a site-specific report is not generated, the proposed design shall be based on the worst-case orientation and configuration of the rated home.

R405.3.2.2 Compliance report for certificate of occupancy. A compliance report submitted for obtaining the certificate of occupancy shall include the following:

1. Building street address, or other building site identification.
2. Declaration of the total building performance path on the title page of the energy report and the title page of the building plans.
3. A statement, bearing the name of the individual performing the analysis and generating the report, indicating that the as-built building complies with Section R405.3.
4. The name and version of the compliance software tool.
5. A site-specific energy analysis report that is in compliance with Section R405.3.
6. A final confirmed certificate indicating compliance based on inspection, and a statement indicating that the confirmed rated design of the built home complies with Section R405.3. The certificate shall report the energy features that were confirmed to be in the home, including component-level insulation *R*-values or *U*-factors; results from any required duct system and building envelope air leakage testing; and the type and rated efficiencies of the heating, cooling, mechanical ventilation and service water-heating equipment installed.
7. When on-site renewable energy systems have been installed, the certificate shall report the type and production size of the installed system.

R405.4 Calculation procedure. Calculations of the performance design shall be in accordance with Sections R405.4.1 and R405.4.2.

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R405.4.1 General. Except as specified by this section, the *standard reference design* and *proposed design* shall be configured and analyzed using identical methods and techniques.

R405.4.2 Residence specifications. The *standard reference design* and *proposed design* shall be configured and analyzed as specified by Table R405.4.2(1). Table R405.4.2(1) shall include, by reference, all notes contained in Table R402.1.3.

TABLE R405.4.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Above-grade walls	Type: mass where the proposed wall is a mass wall; otherwise wood frame.	As proposed
	Gross area: same as proposed.	As proposed
	U-factor: as specified in Table R402.1.2.	As proposed
	Solar absorptance = 0.75.	As proposed
	Emittance = 0.90.	As proposed
Basement and crawl space walls	Type: same as proposed.	As proposed
	Gross area: same as proposed.	As proposed
	U-factor: as specified in Table R402.1.2, with the insulation layer on the interior side of the walls.	As proposed
Above-grade floors	Type: wood frame.	As proposed
	Gross area: same as proposed.	As proposed
	U-factor: as specified in Table R402.1.2.	As proposed
Ceilings	Type: wood frame.	As proposed
	Gross area: same as proposed.	As proposed
	U-factor: as specified in Table R402.1.2.	As proposed
Roofs	Type: composition shingle on wood sheathing.	As proposed
	Gross area: same as proposed.	As proposed
	Solar absorptance = 0.75.	As proposed
	Emittance = 0.90.	As proposed
Attics	Type: vented with an aperture of 1 ft^2 per 300 ft^2 of ceiling area.	As proposed
Foundations	Type: same as proposed.	As proposed
	Foundation wall area above and below grade and soil characteristics: same as proposed.	As proposed
Opaque doors	Area: 40 ft^2.	As proposed
	Orientation: North.	As proposed
	U-factor: same as fenestration as specified in Table R402.1.2.	As proposed
Vertical fenestration other than opaque doors	Total area[h] = (a) The proposed glazing area, where the proposed glazing area is less than 15 percent of the conditioned floor area. (b) 15 percent of the conditioned floor area, where the proposed glazing area is 15 percent or more of the conditioned floor area.	As proposed
	Orientation: equally distributed to four cardinal compass orientations (N, E, S & W).	As proposed
	U-factor: as specified in Table R402.1.2.	As proposed
	SHGC: as specified in Table R402.1.2 except for climate zones without an SHGC requirement, the SHGC shall be equal to 0.40.	As proposed
	Interior shade fraction: 0.92 – (0.21 × SHGC for the standard reference design).	Interior shade fraction: 0.92 – (0.21 × SHGC as proposed)
	External shading: none	As proposed

(continued)

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TABLE R405.4.2(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Skylights	None	As proposed
Thermally isolated sunrooms	None	As proposed
Air exchange rate	The air leakage rate at a pressure of 0.2 inch w.g. (50 Pa) shall be Climate Zones 0 through 2: 5.0 air changes per hour. Climate Zones 3 through 8: 3.0 air changes per hour.	The measured air exchange rate.[a]
	The mechanical ventilation rate shall be in addition to the air leakage rate and shall be the same as in the proposed design, but not greater than $0.01 \times CFA + 7.5 \times (N_{br} + 1)$ where: CFA = conditioned floor area, ft^2. N_{br} = number of bedrooms. The mechanical ventilation system type shall be the same as in the proposed design. Energy recovery shall not be assumed for mechanical ventilation.	The mechanical ventilation rate[b] shall be in addition to the air leakage rate and shall be as proposed.
Mechanical ventilation	Where mechanical ventilation is not specified in the proposed design: None Where mechanical ventilation is specified in the proposed design, the annual vent fan energy use, in units of kWh/yr, shall equal $(1/e_f) \times [0.0876 \times CFA + 65.7 \times (N_{br} + 1)]$ where: e_f = the minimum fan efficacy, as specified in Table 403.6.2, corresponding to the system type at a flow rate of $0.01 \times CFA + 7.5 \times (N_{br} + 1)$ CFA = conditioned floor area, ft^2. N_{br} = number of bedrooms.	As proposed
Internal gains	IGain, in units of Btu/day per dwelling unit, shall equal $17{,}900 + 23.8 \times CFA + 4{,}104 \times N_{br}$ where: CFA = conditioned floor area, ft^2. N_{br} = number of bedrooms.	Same as standard reference design.
Internal mass	Internal mass for furniture and contents: 8 pounds per square foot of floor area.	Same as standard reference design, plus any additional mass specifically designed as a thermal storage element[c] but not integral to the building envelope or structure.
Structural mass	For masonry floor slabs: 80 percent of floor area covered by R-2 carpet and pad, and 20 percent of floor directly exposed to room air.	As proposed
	For masonry basement walls: as proposed, but with insulation as specified in Table R402.1.3, located on the interior side of the walls.	As proposed
	For other walls, ceilings, floors, and interior walls: wood frame construction.	As proposed
Heating systems[d, e]	For other than electric heating without a heat pump: as proposed. Where the proposed design utilizes electric heating without a heat pump, the standard reference design shall be an air source heat pump meeting the requirements of Section C403 of the IECC—Commercial Provisions. Capacity: sized in accordance with Section R403.7.	As proposed
Cooling systems[d, f]	As proposed. Capacity: sized in accordance with Section R403.7.	As proposed

(continued)

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TABLE R405.4.2(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

<table>
<tr><th>BUILDING COMPONENT</th><th>STANDARD REFERENCE DESIGN</th><th colspan="3">PROPOSED DESIGN</th></tr>
<tr><td rowspan="8">Service water heating[d, g]</td><td rowspan="8">As proposed.
Use, in units of gal/day = 25.5 + (8.5 × N_{br})
where:
N_{br} = number of bedrooms.</td><td colspan="3">As proposed
Use, in units of gal/day = 25.5 + (8.5 × N_{br}) × (1 – HWDS)
where:
N_{br} = number of bedrooms.
HWDS = factor for the compactness of the hot water distribution system.</td></tr>
<tr><td colspan="2">Compactness ratio[i] factor</td><td>HWDS</td></tr>
<tr><td>1 story</td><td>2 or more stories</td><td></td></tr>
<tr><td>> 60%</td><td>> 30%</td><td>0</td></tr>
<tr><td>> 30% to ≤ 60%</td><td>> 15% to ≤ 30%</td><td>0.05</td></tr>
<tr><td>> 15% to ≤ 30%</td><td>> 7.5% to ≤ 15%</td><td>0.10</td></tr>
<tr><td>< 15%</td><td>< 7.5%</td><td>0.15</td></tr>
<tr><td>Thermal distribution systems</td><td>Duct insulation: in accordance with Section R403.3.1.
A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems.
Duct location: same as proposed design.
Exception: For nonducted heating and cooling systems that do not have a fan, the standard reference design thermal distribution system efficiency (DSE) shall be 1. For tested duct systems, the leakage rate shall be 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area at a pressure of differential of 0.1 inch w.g. (25 Pa).</td><td colspan="3">Duct location: as proposed.
Duct insulation: as proposed.
As tested or, where not tested, as specified in Table R405.4.2(2).</td></tr>
<tr><td>Thermostat</td><td>Type: Manual, cooling temperature setpoint = 75°F;
Heating temperature setpoint = 72°F.</td><td colspan="3">Same as standard reference design.</td></tr>
<tr><td>Dehumidistat</td><td>Where a mechanical ventilation system with latent heat recovery is not specified in the proposed design:
None.
Where the proposed design utilizes a mechanical ventilation system with latent heat recovery:
Dehumidistat type: manual, setpoint = 60% relative humidity.
Dehumidifier: whole-dwelling with integrated energy factor = 1.77 liters/kWh.</td><td colspan="3">Same as standard reference design.</td></tr>
</table>

For SI: 1 square foot = 0.93 m^2, 1 British thermal unit = 1055 J, 1 pound per square foot = 4.88 kg/m^2, 1 gallon (US) = 3.785 L, °C = (°F-32)/1.8, 1 degree = 0.79 rad.

a. Where required by the code official, testing shall be conducted by an approved party. Hourly calculations as specified in the ASHRAE *Handbook of Fundamentals,* or the equivalent, shall be used to determine the energy loads resulting from infiltration.

b. The combined air exchange rate for infiltration and mechanical ventilation shall be determined in accordance with Equation 43 of 2001 ASHRAE *Handbook of Fundamentals,* page 26.24 and the "Whole-house Ventilation" provisions of 2001 ASHRAE *Handbook of Fundamentals,* page 26.19 for intermittent mechanical ventilation.

c. Thermal storage element shall mean a component that is not part of the floors, walls or ceilings that is part of a passive solar system, and that provides thermal storage such as enclosed water columns, rock beds, or phase-change containers. A thermal storage element shall be in the same room as fenestration that faces within 15 degrees (0.26 rad) of true south, or shall be connected to such a room with pipes or ducts that allow the element to be actively charged.

d. For a proposed design with multiple heating, cooling or water heating systems using different fuel types, the applicable standard reference design system capacities and fuel types shall be weighted in accordance with their respective loads as calculated by accepted engineering practice for each equipment and fuel type present.

e. For a proposed design without a proposed heating system, a heating system having the prevailing federal minimum efficiency shall be assumed for both the standard reference design and proposed design.

f. For a proposed design home without a proposed cooling system, an electric air conditioner having the prevailing federal minimum efficiency shall be assumed for both the standard reference design and the proposed design.

g. For a proposed design with a nonstorage-type water heater, a 40-gallon storage-type water heater having the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For a proposed design without a proposed water heater, a 40-gallon storage-type water heater having the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed for both the proposed design and standard reference design.

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TABLE R405.4.2(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

h. For residences with conditioned basements, R-2 and R-4 residences, and for townhouses, the following formula shall be used to determine glazing area:

$AF = A_s \times FA \times F$

where:

AF = Total glazing area.

A_s = Standard reference design total glazing area.

FA = (Above-grade thermal boundary gross wall area)/(above-grade boundary wall area + 0.5 × below-grade boundary wall area).

F = (above-grade thermal boundary wall area)/(above-grade thermal boundary wall area + common wall area) or 0.56, whichever is greater.

and where:

Thermal boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.

Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.

Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

i. The factor for the compactness of the hot water distribution system is the ratio of the area of the rectangle that bounds the source of hot water and the fixtures that it serves (the "hot water rectangle") divided by the floor area of the dwelling.
   1. Sources of hot water include water heaters, or in multiple-family buildings with central water heating systems, circulation loops or electric heat traced pipes.
   2. The hot water rectangle shall include the source of hot water and the points of termination of all hot water fixture supply piping.
   3. The hot water rectangle shall be shown on the floor plans and the area shall be computed to the nearest square foot.
   4. Where there is more than one water heater and each water heater serves different plumbing fixtures and appliances, it is permissible to establish a separate hot water rectangle for each hot water distribution system and add the area of these rectangles together to determine the compactness ratio.
   5. The basement or attic shall be counted as a story when it contains the water heater.
   6. Compliance shall be demonstrated by providing a drawing on the plans that shows the hot water distribution system rectangle(s), comparing the area of the rectangle(s) to the area of the dwelling and identifying the appropriate compactness ratio and *HWDS* factor.

TABLE R405.4.2(2)
DEFAULT DISTRIBUTION SYSTEM EFFICIENCIES FOR PROPOSED DESIGNS[a]

DISTRIBUTION SYSTEM CONFIGURATION AND CONDITION	FORCED AIR SYSTEMS	HYDRONIC SYSTEMS[b]
Distribution system components located in unconditioned space	—	0.95
Untested distribution systems entirely located in conditioned space[c]	0.88	1
"Ductless" systems[d]	1	—

a. Default values in this table are for untested distribution systems, which must still meet minimum requirements for duct system insulation.

b. Hydronic systems shall mean those systems that distribute heating and cooling energy directly to individual spaces using liquids pumped through closed-loop piping and that do not depend on ducted, forced airflow to maintain space temperatures.

c. Entire system in conditioned space shall mean that no component of the distribution system, including the air-handler unit, is located outside of the conditioned space.

d. Ductless systems shall be allowed to have forced airflow across a coil but shall not have any ducted airflow external to the manufacturer's air-handler enclosure.

R405.5 Calculation software tools. Calculation software, where used, shall be in accordance with Sections R405.5.1 through R405.5.3.

R405.5.1 Minimum capabilities. Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the *standard reference design* and the *proposed design* and shall include the following capabilities:

1. Computer generation of the *standard reference design* using only the input for the *proposed design.* The calculation procedure shall not allow the user to directly modify the building component characteristics of the *standard reference design.*
2. Calculation of whole-building (as a single *zone*) sizing for the heating and cooling equipment in the *standard reference design* residence in accordance with Section R403.7.
3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing.
4. Printed *code official* inspection checklist listing each of the *proposed design* component characteristics from Table R405.4.2(1) determined by the analysis to provide compliance, along with their respective performance ratings such as *R*-value, *U*-factor, SHGC, HSPF, AFUE, SEER and EF.

R405.5.2 Specific approval. Performance analysis tools meeting the applicable provisions of Section R405 shall be permitted to be *approved.* Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall be permitted to approve such tools for a specified application or limited scope.

R405.5.3 Input values. When calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from an *approved* source.

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SECTION R406
ENERGY RATING INDEX COMPLIANCE ALTERNATIVE

R406.1 Scope. This section establishes criteria for compliance using an Energy Rating Index (ERI) analysis.

R406.2 ERI compliance. Compliance based on the ERI requires that the rated design meets all of the following:

1. The requirements of the sections indicated within Table R406.2.
2. Maximum ERI of Table R406.5.

TABLE R406.2
REQUIREMENTS FOR ENERGY RATING INDEX

SECTION[a]	TITLE
General	
R401.2.5	Additional efficiency packages
R401.3	Certificate
Building Thermal Envelope	
R402.1.1	Vapor retarder
R402.2.3	Eave baffle
R402.2.4.1	Access hatches and doors
R402.2.10.1	Crawl space wall insulation installation
R402.4.1.1	Installation
R402.4.1.2	Testing
Mechanical	
R403.1	Controls
R403.3 except Sections R403.3.2, R403.3.3 and R403.3.6	Ducts
R403.4	Mechanical system piping insulation
R403.5.1	Heated water calculation and temperature maintenance systems
R403.5.3	Drain water heat recovery units
R403.6	Mechanical ventilation
R403.7	Equipment sizing and efficiency rating
R403.8	Systems serving multiple dwelling units
R403.9	Snow melt and ice systems
R403.10	Energy consumption of pools and spas
R403.11	Portable spas
R403.12	Residential pools and permanent residential spas
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R406.3	Building thermal envelope

a. Reference to a code section includes all of the relative subsections except as indicated in the table.

R406.3 Building thermal envelope. Building and portions thereof shall comply with Section R406.3.1 or R406.3.2.

R406.3.1 On-site renewables are not included. Where on-site renewable energy is not included for compliance using the ERI analysis of Section R406.4, the proposed total building thermal envelope UA, which is sum of *U*-factor times assembly area, shall be less than or equal to the building thermal envelope UA using the prescriptive *U*-factors from Table R402.1.2 multiplied by 1.15 in accordance with Equation 4-1. The area-weighted maximum fenestration SHGC permitted in Climate Zones 0 through 3 shall be 0.30.

$$UA_{\text{Proposed design}} = 1.15 \times UA_{\text{Prescriptive reference design}} \quad \textbf{(Equation 4-1)}$$

R406.3.2 On-site renewables are included. Where on-site renewable energy is included for compliance using the ERI analysis of Section R406.4, the *building thermal envelope* shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2018 *International Energy Conservation Code*.

R406.4 Energy Rating Index. The Energy Rating Index (ERI) shall be determined in accordance with RESNET/ICC 301 except for buildings covered by the *International Residential Code*, the ERI reference design ventilation rate shall be in accordance with Equation 4-2.

Ventilation rate, CFM = (0.01 × total square foot area of house) + [7.5 × (number of bedrooms + 1)] **(Equation 4-2)**

Energy used to recharge or refuel a vehicle used for transportation on roads that are not on the building site shall not be included in the *ERI reference design* or the *rated design*. For compliance purposes, any reduction in energy use of the rated design associated with on-site renewable energy shall not exceed 5 percent of the total energy use.

R406.5 ERI-based compliance. Compliance based on an ERI analysis requires that the *rated proposed design* and confirmed built dwelling be shown to have an ERI less than or equal to the appropriate value indicated in Table R406.5 when compared to the *ERI reference design*.

TABLE R406.5
MAXIMUM ENERGY RATING INDEX

CLIMATE ZONE	ENERGY RATING INDEX
0-1	52
2	52
3	51
4	54
5	55
6	54
7	53
8	53

R406.6 Verification by approved agency. Verification of compliance with Section R406 as outlined in Sections R406.4 and R406.6 shall be completed by an *approved* third

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party. Verification of compliance with Section R406.2 shall be completed by the authority having jurisdiction or an *approved* third-party inspection agency in accordance with Section R105.4.

R406.7 Documentation. Documentation of the software used to determine the ERI and the parameters for the *residential building* shall be in accordance with Sections R406.7.1 through R406.7.4.

R406.7.1 Compliance software tools. Software tools used for determining ERI shall be *Approved* Software Rating Tools in accordance with RESNET/ICC 301.

R406.7.2 Compliance report. Compliance software tools shall generate a report that documents that the home and the ERI score of the *rated design* complies with Sections R406.2, R406.3 and R406.4. Compliance documentation shall be created for the proposed design and shall be submitted with the application for the building permit. Confirmed compliance documents of the built *dwelling unit* shall be created and submitted to the code official for review before a certificate of occupancy is issued. Compliance reports shall include information in accordance with Sections R406.7.2.1 and R406.7.2.2.

R406.7.2.1 Proposed compliance report for permit application. Compliance reports submitted with the application for a building permit shall include the following:

1. Building street address, or other *building site* identification.
2. Declare ERI on title page and building plans.
3. The name of the individual performing the analysis and generating the compliance report.
4. The name and version of the compliance software tool.
5. Documentation of all inputs entered into the software used to produce the results for the reference design and/or the rated home.
6. A certificate indicating that the proposed design has an ERI less than or equal to the appropriate score indicated in Table R406.5 when compared to the ERI reference design. The certificate shall document the building component energy specifications that are included in the calculation, including: component level insulation *R*-values or *U*-factors; assumed duct system and building envelope air leakage testing results; and the type and rated efficiencies of proposed heating, cooling, mechanical ventilation, and service water-heating equipment to be installed. If on-site renewable energy systems will be installed, the certificate shall report the type and production size of the proposed system.
7. When a site-specific report is not generated, the proposed design shall be based on the worst-case orientation and configuration of the rated home.

R406.7.2.2 Confirmed compliance report for a certificate of occupancy. A confirmed compliance report submitted for obtaining the certificate of occupancy shall be made site and address specific and include the following:

1. Building street address or other *building site* identification.
2. Declaration of ERI on title page and on building plans.
3. The name of the individual performing the analysis and generating the report.
4. The name and version of the compliance software tool.
5. Documentation of all inputs entered into the software used to produce the results for the reference design and/or the rated home.
6. A final confirmed certificate indicating that the confirmed rated design of the built home complies with Sections R406.2 and R406.4. The certificate shall report the energy features that were confirmed to be in the home, including: component-level insulation *R*-values or *U*-factors; results from any required duct system and building envelope air leakage testing; and the type and rated efficiencies of the heating, cooling, mechanical ventilation, and service water-heating equipment installed. Where on-site renewable energy systems have been installed on or in the home, the certificate shall report the type and production size of the installed system.

R406.7.3 Renewable energy certificate (REC) documentation. Where on-site renewable energy is included in the calculation of an ERI, one of the following forms of documentation shall be provided to the code official:

1. Substantiation that the RECs associated with the on-site renewable energy are owned by, or retired on behalf of, the homeowner.
2. A contract that conveys to the homeowner the RECs associated with the on-site renewable energy, or conveys to the homeowner an equivalent quantity of RECs associated with other renewable energy.

R406.7.4 Additional documentation. The *code official* shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the *ERI reference design*.
2. A certification signed by the builder providing the building component characteristics of the *rated design.*
3. Documentation of the actual values used in the software calculations for the *rated design*.

R406.7.5 Specific approval. Performance analysis tools meeting the applicable subsections of Section R406 shall be *approved*. Documentation demonstrating the approval

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of performance analysis tools in accordance with Section R406.7.1 shall be provided.

R406.7.6 Input values. Where calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from RESNET/ICC 301.

**

SECTION R407
TROPICAL CLIMATE REGION COMPLIANCE PATH

R407.1 Scope. This section establishes alternative criteria for residential buildings in the tropical region at elevations less than 2,400 feet (731.5 m) above sea level.

R407.2 Tropical climate region. Compliance with this section requires the following:

1. Not more than one-half of the *occupied* space is air conditioned.
2. The *occupied* space is not heated.
3. Solar, wind or other renewable energy source supplies not less than 80 percent of the energy for service water heating.
4. Glazing in *conditioned spaces* has a *solar heat gain coefficient* (SHGC) of less than or equal to 0.40, or has an overhang with a projection factor equal to or greater than 0.30.
5. Permanently installed lighting is in accordance with Section R404.
6. The exterior roof surface complies with one of the options in Table C402.3 of the *International Energy Conservation Code*–Commercial Provisions or the roof or ceiling has insulation with an *R*-value of R-15 or greater. Where attics are present, attics above the insulation are vented and attics below the insulation are unvented.
7. Roof surfaces have a slope of not less than $^1/_4$ unit vertical in 12 units horizontal (21-percent slope). The finished roof does not have water accumulation areas.
8. Operable fenestration provides a ventilation area of not less than 14 percent of the floor area in each room. Alternatively, equivalent ventilation is provided by a ventilation fan.
9. Bedrooms with *exterior walls* facing two different directions have operable fenestration on exterior walls facing two directions.
10. Interior doors to bedrooms are capable of being secured in the open position.
11. A ceiling fan or ceiling fan rough-in is provided for bedrooms and the largest space that is not used as a bedroom.

SECTION R408
ADDITIONAL EFFICIENCY PACKAGE OPTIONS

R408.1 Scope. This section establishes additional efficiency package options to achieve additional energy efficiency in accordance with Section R401.2.5.

R408.2 Additional efficiency package options. Additional efficiency package options for compliance with Section R401.2.1 are set forth in Sections R408.2.1 through R408.2.5.

R408.2.1 Enhanced envelope performance option. The total *building thermal envelope* UA, the sum of *U*-factor times assembly area, shall be less than or equal to 95 percent of the total UA resulting from multiplying the *U*-factors in Table R402.1.2 by the same assembly area as in the proposed building. The UA calculation shall be performed in accordance with Section R402.1.5. The area-weighted average SHGC of all glazed fenestration shall be less than or equal to 95 percent of the maximum glazed fenestration SHGC in Table R402.1.2.

R408.2.2 More efficient HVAC equipment performance option. Heating and cooling *equipment* shall meet one of the following efficiencies:

1. Greater than or equal to 95 AFUE natural gas furnace and 16 SEER air conditioner.
2. Greater than or equal to 10 HSPF/16 SEER air source heat pump.
3. Greater than or equal to 3.5 COP ground source heat pump.

For multiple cooling systems, all systems shall meet or exceed the minimum efficiency requirements in this section and shall be sized to serve 100 percent of the cooling design load. For multiple heating systems, all systems shall meet or exceed the minimum efficiency requirements in this section and shall be sized to serve 100 percent of the heating design load.

R408.2.3 Reduced energy use in service water-heating option. The hot water system shall meet one of the following efficiencies:

1. Greater than or equal to 0.82 EF fossil fuel service water-heating system.
2. Greater than or equal to 2.0 EF electric service water-heating system.
3. Greater than or equal to 0.4 solar fraction solar water-heating system.

R408.2.4 More efficient duct thermal distribution system option. The thermal distribution system shall meet one of the following efficiencies:

1. 100 percent of ducts and air handlers located entirely within the *building thermal envelope*.
2. 100 percent of ductless thermal distribution system or hydronic thermal distribution system located completely inside the *building thermal envelope*.

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3. 100 percent of duct thermal distribution system located in *conditioned space* as defined by Section R403.3.2.

R408.2.5 Improved air sealing and efficient ventilation system option. The measured air leakage rate shall be less than or equal to 3.0 ACH50, with either an Energy Recovery Ventilator (ERV) or Heat Recovery Ventilator (HRV) installed. Minimum HRV and ERV requirements, measured at the lowest tested net supply airflow, shall be greater than or equal to 75 percent Sensible Recovery Efficiency (SRE), less than or equal to 1.1 cubic feet per minute per watt (0.03 m^3/min/watt) and shall not use recirculation as a defrost strategy. In addition, the ERV shall be greater than or equal to 50 percent Latent Recovery/Moisture Transfer (LRMT).

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CHAPTER 5 [RE]
EXISTING BUILDINGS

User note:

About this chapter: *Many buildings are renovated or altered in numerous ways that could affect the energy use of the building as a whole. Chapter 5 requires the application of certain parts of Chapter 4 in order to maintain, if not improve, the conservation of energy by the renovated or altered building.*

SECTION R501
GENERAL

R501.1 Scope. The provisions of this chapter shall control the *alteration*, *repair*, *addition* and change of occupancy of existing *buildings* and structures.

R501.1.1 General. Except as specified in this chapter, this code shall not be used to require the removal, *alteration* or abandonment of, nor prevent the continued use and maintenance of, an existing *building* or *building* system lawfully in existence at the time of adoption of this code. Unaltered portions of the existing *building* or *building* supply system shall not be required to comply with this code.

R501.2 Compliance. *Additions*, *alterations*, *repairs* or changes of occupancy to, or relocation of, an existing *building*, *building* system or portion thereof shall comply with Section R502, R503, R504 or R505, respectively, in this code. Changes where unconditioned space is changed to *conditioned space* shall comply with Section R502.

R501.3 Maintenance. *Buildings* and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices and systems that are required by this code shall be maintained in conformance to the code edition under which installed. The owner or the owner's authorized agent shall be responsible for the maintenance of *buildings* and structures. The requirements of this chapter shall not provide the basis for removal or abrogation of energy conservation, fire protection and safety systems and devices in existing structures.

R501.4 Compliance. *Alterations*, *repairs*, *additions* and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for *alterations*, *repairs*, *additions* and changes of occupancy or relocation, respectively, in this code and the *International Residential Code*, *International Building Code*, *International Existing Building Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *International Plumbing Code*, *International Property Maintenance Code*, *International Private Sewage Disposal Code* and NFPA 70.

R501.5 New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for *repairs*, provided that hazards to life, health or property are not created. Hazardous materials shall not be used where the code for new construction would not allow their use in *buildings* of similar occupancy, purpose and location.

R501.6 Historic buildings. Provisions of this code relating to the construction, *repair, alteration*, restoration and movement of structures, and *change of occupancy* shall not be mandatory for *historic buildings* provided that a report has been submitted to the code official and signed by the owner, a *registered design professional*, or a representative of the State Historic Preservation Office or the historic preservation authority having jurisdiction, demonstrating that compliance with that provision would threaten, degrade or destroy the historic form, fabric or function of the *building*.

SECTION R502
ADDITIONS

R502.1 General. *Additions* to an existing *building*, *building* system or portion thereof shall conform to the provisions of this code as those provisions relate to new construction without requiring the unaltered portion of the existing *building* or *building* system to comply with this code. *Additions* shall not create an unsafe or hazardous condition or overload existing *building* systems. An *addition* shall be deemed to comply with this code where the *addition* alone complies, where the existing *building* and *addition* comply with this code as a single building, or where the *building* with the *addition* does not use more energy than the existing *building*. *Additions* shall be in accordance with Section R502.2 or R502.3.

R502.2 Change in space conditioning. Any unconditioned or low-energy space that is altered to become *conditioned space* shall be required to be brought into full compliance with this code.

Exceptions:

1. Where the simulated performance option in Section R405 is used to comply with this section, the annual energy cost of the *proposed design* is permitted to be 110 percent of the annual energy cost otherwise allowed by Section R405.2.
2. Where the Total UA, as determined in Section R402.1.5, of the existing *building* and the *addition*, and any *alterations* that are part of the project, is less than or equal to the Total UA generated for the existing *building*.
3. Where complying in accordance with Section R405 and the annual energy cost or energy use of the *addition* and the existing *building*, and any

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alterations that are part of the project, is less than or equal to the annual energy cost of the existing *building*. The *addition* and any *alterations* that are part of the project shall comply with Section R405 in its entirety.

R502.3 Prescriptive compliance. *Additions* shall comply with Sections R502.3.1 through R502.3.4.

R502.3.1 Building envelope. New *building* envelope assemblies that are part of the *addition* shall comply with Sections R402.1, R402.2, R402.3.1 through R402.3.5, and R402.4.

Exception: New envelope assemblies are exempt from the requirements of Section R402.4.1.2.

R502.3.2 Heating and cooling systems. HVAC ducts newly installed as part of an *addition* shall comply with Section R403.

Exception: Where ducts from an existing heating and cooling system are extended to an *addition*.

R502.3.3 Service hot water systems. New service hot water systems that are part of the *addition* shall comply with Section R403.5.

R502.3.4 Lighting. New lighting systems that are part of the *addition* shall comply with Section R404.1.

SECTION R503
ALTERATIONS

R503.1 General. *Alterations* to any building or structure shall comply with the requirements of the code for new construction, without requiring the unaltered portions of the existing building or building system to comply with this code. *Alterations* shall be such that the existing building or structure is not less conforming to the provisions of this code than the existing *building* or structure was prior to the *alteration*.

Alterations shall not create an unsafe or hazardous condition or overload *existing* building systems. *Alterations* shall be such that the existing *building* or structure does not use more energy than the existing building or structure prior to the *alteration*. *Alterations* to existing *buildings* shall comply with Sections R503.1.1 through R503.1.4.

R503.1.1 Building envelope. Building envelope assemblies that are part of the *alteration* shall comply with Section R402.1.2 or R402.1.4, Sections R402.2.1 through R402.2.12, R402.3.1, R402.3.2, R402.4.3 and R402.4.5.

Exception: The following alterations shall not be required to comply with the requirements for new construction provided that the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation.
3. Construction where the existing roof, wall or floor cavity is not exposed.
4. Roof recover.
5. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.
6. Surface-applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided that the code does not require the glazing or fenestration assembly to be replaced.

R503.1.1.1 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for *U*-factor and SHGC as specified in Table R402.1.3. Where more than one replacement fenestration unit is to be installed, an area-weighted average of the *U*-factor, SHGC or both of all replacement fenestration units shall be an alternative that can be used to show compliance.

R503.1.2 Heating and cooling systems. HVAC ducts newly installed as part of an *alteration* shall comply with Section R403.

Exception: Where ducts from an existing heating and cooling system are extended to an *addition*.

R503.1.3 Service hot water systems. New service hot water systems that are part of the *alteration* shall comply with Section R403.5.

R503.1.4 Lighting. New lighting systems that are part of the *alteration* shall comply with Section R404.1.

Exception: *Alterations* that replace less than 10 percent of the luminaires in a space, provided that such alterations do not increase the installed interior lighting power.

SECTION R504
REPAIRS

R504.1 General. *Buildings*, structures and parts thereof shall be repaired in compliance with Section R501.3 and this section. Work on nondamaged components necessary for the required *repair* of damaged components shall be considered to be part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section R501.3, ordinary repairs exempt from *permit*, and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.

R504.2 Application. For the purposes of this code, the following shall be considered to be *repairs*:

1. Glass-only replacements in an existing sash and frame.
2. Roof *repairs*.

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3. *Repairs* where only the bulb, ballast or both within the existing luminaires in a space are replaced provided that the replacement does not increase the installed interior lighting power.

SECTION R505
CHANGE OF OCCUPANCY OR USE

R505.1 General. Any space that is converted to a dwelling unit or portion thereof from another use or occupancy shall comply with this code.

Exception: Where the simulated performance option in Section R405 is used to comply with this section, the annual energy cost of the *proposed design* is permitted to be 110 percent of the annual energy cost allowed by Section R405.2.

R505.1.1 Unconditioned space. Any unconditioned or low-energy space that is altered to become a *conditioned space* shall comply with Section R502.

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CHAPTER 6 [RE]
REFERENCED STANDARDS

User note:

About this chapter: *This code contains numerous references to standards promulgated by other organizations that are used to provide requirements for materials and methods of construction. Chapter 6 contains a comprehensive list of all standards that are referenced in this code. These standards, in essence, are part of this code to the extent of the reference to the standard.*

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section R108.

AAMA

American Architectural Manufacturers Association
1827 Walden Office Square
Suite 550
Schaumburg, IL 60173-4268

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors, and Skylights
R402.4.3

ACCA

Air Conditioning Contractors of America
1330 Braddock Place, Suite 350
Alexandria, VA 22314

ANSI/ACCA 2 Manual J—2016: Residential Load Calculation
R403.7

ANSI/ACCA 3 Manual S—2014: Residential Equipment Selection
R403.7

APSP

Pool & Tub Alliance (formerly the APSP)
2111 Eisenhower Avenue, Suite 500
Alexandria, VA 22314

ANSI/APSP/ICC 14—2019: American National Standard for Portable Electric Spa Energy Efficiency
R403.11

ANSI/APSP/ICC 15a—2011: American National Standard for Residential Swimming Pool and Spas—Includes Addenda A Approved January 9, 2013
R403.12

ASHRAE

ASHRAE
180 Technology Parkway NW
Peachtree Corners, GA 30092

ASHRAE 193—2010(RA 2014): Method of Test for Determining the Airtightness of HVAC Equipment
R403.3.4.1

ASHRAE—2001: 2001 ASHRAE Handbook of Fundamentals
Table R405.5.2(1)

ASHRAE—2021: ASHRAE Handbook of Fundamentals
R402.1.5

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ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

C1363—11: Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
R303.1.4.1

E283—2004(2012): Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen
R402.4.5

E779—2010(2018): Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
R402.4.1.2

E1554/E1554M—E2013: Standard Test Methods for Determining Air Leakage of Air Distribution Systems by Fan Pressurization
R403.3.5

E1827—: 2011(2017): Standard Test Methods for Determining Airtightness of Building Using an Orifice Blower Door
R402.4.1.2

E2178—2013: Standard Test Method for Air Permanence of Building Materials
R303.1.5

CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland, OH 44131-5516

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors and Unit Skylights
R402.4.3

CSA B55.1—2015: Test Method for Measuring Efficiency and Pressure Loss of Drain Water Heat Recovery Units
R403.5.3

CSA B55.2—2015: Drain Water Heat Recovery Units
R403.5.3

DASMA

Door & Access Systems Manufacturers Association
1300 Sumner Avenue
Cleveland, OH 44115-2851

105—2017: Test Method for Thermal Transmittance and Air Infiltration of Garage Doors and Rolling Doors
R303.1.3

HVI

Home Ventilating Institute
1740 Dell Range Blvd, Ste H, PMB 450
Cheyenne, WY 82009

916—18: Airflow Test Procedure
Table R403.6.2

ICC

International Code Council, Inc.
500 New Jersey Avenue NW6th Floor
Washington, DC 20001

ANSI/APSP/ICC 14—2019: American National Standard for Portable Electric Spa Energy Efficiency
R403.11

ANSI/APSP/ICC 15a—2020: American National Standard for Residential Swimming Pool and Spa Energy Efficiency
R403.12

ANSI/RESNET/ICC 301—2019: Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index
R406.4

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ICC—continued

ANSI/RESNET/ICC 380—2019: Standard for Testing Airtightness of Building, Dwelling Unit and Sleeping Unit Enclosures; Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems
R402.4.1.2

IBC—21: International Building Code®
R201.3, R303.1.1, R303.2, R402.1.1, R501.4

ICC 400—17: Standard on the Design and Construction of Log Structures
R402.1

ICC 500—2020: ICC/NSSA Standard for the Design and Construction of Storm Shelters
R402.5

IEBC—21: International Existing Building Code®
R501.4

IECC—06: 2006 International Energy Conservation Code®
R202

IECC—09: 2009 International Energy Conservation Code®
R406.2

IECC—15: 2015 International Energy Conservation Code®
Table R406.5

IFC—21: International Fire Code®
R201.3, R501.4

IFGC—21: International Fuel Gas Code®
R201.3, R501.4

IMC—21: International Mechanical Code®
R201.3, R403.3.3, R403.3.4, R403.6, R501.4

IPC—21: International Plumbing Code®
R201.3, R501.4

IPMC—21: International Property Maintenance Code®
R501.4

IPSDC—21: International Private Sewage Disposal Code®
R501.4

IRC—21: International Residential Code®
R201.3, R303.1.1, R303.2, R402.1.1, R402.2.10.1, R403.3.3, R403.3.4, R403.6, R501.4

IEEE

Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, 17th Floor
New York, NY 10016-5997

515.1—2012: IEEE Standard for the Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Commercial Applications
R403.5.1.2

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

70—20: National Electrical Code
R501.4

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NFRC

National Fenestration Rating Council, Inc.
6305 Ivy Lane, Suite 140
Greenbelt, MD 20770

100—2020: Procedure for Determining Fenestration Products *U*-factors
R303.1.3

200—2020: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
R303.1.3

400—2020: Procedure for Determining Fenestration Product Air Leakage
R402.4.3

RESNET

Residential Energy Services Network, Inc.
P.O. Box 4561
Oceanside, CA 92052-4561

ANSI/RESNET/ICC 301—2019: Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index
R406.4, R406.7.1, R406.7.6

ANSI/RESNET/ICC 380—2019: Standard for Testing Airtightness of Building, Dwelling Unit and Sleeping Unit Enclosures; Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems
R402.4.1.2, R403.3.5

UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062

127—2011: Standard for Factory-Built Fireplaces—with Revisions through July 2016
R402.4.2

515—2015: Standard for Electrical Resistance Trace Heating for Commercial Applications
R403.5.1.2

US-FTC

United States-Federal Trade Commission
600 Pennsylvania Avenue NW
Washington, DC 20580

CFR Title 16 (2015): R-value Rule
R303.1.4

WDMA

Window and Door Manufacturers Association
2025 M Street NW, Suite 800
Washington, DC 20036-3309

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors and Skylights
R402.4.3

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APPENDIX RA
BOARD OF APPEALS—RESIDENTIAL

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User note:

About this appendix: *Appendix RA provides criteria for board of appeals members. Also provided are procedures by which the board of appeals should conduct its business.*

SECTION RA101
GENERAL

RA101.1 Scope. A board of appeals shall be established within the jurisdiction for the purpose of hearing applications for modification of the requirements of this code pursuant to the provisions of Section R110. The board shall be established and operated in accordance with this section, and shall be authorized to hear evidence from appellants and the code official pertaining to the application and intent of this code for the purpose of issuing orders pursuant to these provisions.

RA101.2 Application for appeal. Any person shall have the right to appeal a decision of the code official to the board. An application for appeal shall be based on a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.

RA101.2.1 Limitation of authority. The board shall not have authority to waive requirements of this code or interpret the administration of this code.

RA101.2.2 Stays of enforcement. Appeals of notice and orders, other than Imminent Danger notices, shall stay the enforcement of the notice and order until the appeal is heard by the board.

RA101.3 Membership of board. The board shall consist of five voting members appointed by the chief appointing authority of the jurisdiction. Each member shall serve for **[INSERT NUMBER OF YEARS]** years or until a successor has been appointed. The board members' terms shall be staggered at intervals, so as to provide continuity. The code official shall be an ex officio member of said board but shall not vote on any matter before the board.

RA101.3.1 Qualifications. The board shall consist of five individuals, who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.

RA101.3.2 Alternate members. The chief appointing authority is authorized to appoint two alternate members who shall be called by the board chairperson to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership, and shall be appointed for the same term or until a successor has been appointed.

RA101.3.3 Vacancies. Vacancies shall be filled for an unexpired term in the same manner in which original appointments are required to be made.

RA101.3.4 Chairperson. The board shall annually select one of its members to serve as chairperson.

RA101.3.5 Secretary. The chief appointing authority shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings, which shall set forth the reasons for the board's decision, the vote of each member, the absence of a member and any failure of a member to vote.

RA101.3.6 Conflict of interest. A member with any personal, professional or financial interest in a matter before the board shall declare such interest and refrain from participating in discussions, deliberations and voting on such matters.

RA101.3.7 Compensation of members. Compensation of members shall be determined by law.

RA101.3.8 Removal from the board. A member shall be removed from the board prior to the end of their term only for cause. Any member with continued absence from regular meeting of the board may be removed at the discretion of the chief appointing authority.

RA101.4 Rules and procedures. The board shall establish policies and procedures necessary to carry out its duties consistent with the provisions of this code and applicable state law. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be presented.

RA101.5 Notice of meeting. The board shall meet upon notice from the chairperson, within 10 days of the filing of an appeal or at stated periodic intervals.

RA101.5.1 Open hearing. All hearings before the board shall be open to the public. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

RA101.5.2 Quorum. Three members of the board shall constitute a quorum.

RA101.5.3 Postponed hearing. When five members are not present to hear an appeal, either the appellant or the

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appellant's representative shall have the right to request a postponement of the hearing.

RA101.6 Legal counsel. The jurisdiction shall furnish legal counsel to the board to provide members with general legal advice concerning matters before them for consideration. Members shall be represented by legal counsel at the jurisdiction's expense in all matters arising from service within the scope of their duties.

RA101.7 Board decision. The board shall only modify or reverse the decision of the code official by a concurring vote of three or more members.

RA101.7.1 Resolution. The decision of the board shall be by resolution. Every decision shall be promptly filed in writing in the office of the code official within 3 days and shall be open to the public for inspection. A certified copy shall be furnished to the appellant or the appellant's representative and to the code official.

RA101.7.2 Administration. The code official shall take immediate action in accordance with the decision of the board.

RA101.8 Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

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APPENDIX RB

SOLAR-READY PROVISIONS—DETACHED ONE- AND TWO-FAMILY DWELLINGS AND TOWNHOUSES

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User note:

About this appendix: *Harnessing the heat or radiation from the sun's rays is a method to reduce the energy consumption of a building. Although Appendix RB does not require solar systems to be installed for a building, it does require the space(s) for installing such systems, providing pathways for connections and requiring adequate structural capacity of roof systems to support the systems.*

SECTION RB101
SCOPE

RB101.1 General. These provisions shall be applicable for new construction where solar-ready provisions are required.

SECTION RB102
GENERAL DEFINITION

SOLAR-READY ZONE. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

SECTION RB103
SOLAR-READY ZONE

RB103.1 General. New detached one- and two-family dwellings, and townhouses with not less than 600 square feet (55.74 m^2) of roof area oriented between 110 degrees and 270 degrees of true north shall comply with Sections RB103.2 through RB103.8.

Exceptions:

1. New residential buildings with a permanently installed on-site renewable energy system.
2. A building where all areas of the roof that would otherwise meet the requirements of Section RB103 are in full or partial shade for more than 70 percent of daylight hours annually.

RB103.2 Construction document requirements for solar-ready zone. Construction documents shall indicate the solar-ready zone.

RB103.3 Solar-ready zone area. The total solar-ready zone area shall be not less than 300 square feet (27.87 m^2) exclusive of mandatory access or setback areas as required by the *International Fire Code*. New townhouses three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (185.8 m^2) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m^2). The solar-ready zone shall be composed of areas not less than 5 feet (1524 mm) in width and not less than 80 square feet (7.44 m^2) exclusive of access or setback areas as required by the *International Fire Code*.

RB103.4 Obstructions. Solar-ready zones shall be free from obstructions, including but not limited to vents, chimneys, and roof-mounted equipment.

RB103.5 Shading. The solar-ready zone shall be set back from any existing or new permanently affixed object on the building or site that is located south, east or west of the solar zone a distance not less than two times the object's height above the nearest point on the roof surface. Such objects include, but are not limited to, taller portions of the building itself, parapets, chimneys, antennas, signage, rooftop equipment, trees and roof plantings.

RB103.6 Capped roof penetration sleeve. A capped roof penetration sleeve shall be provided adjacent to a solar-ready zone located on a roof slope of not greater than 1 unit vertical in 12 units horizontal (8-percent slope). The capped roof penetration sleeve shall be sized to accommodate the future photovoltaic system conduit, but shall have an inside diameter of not less than $1^1/_4$ inches (32 mm).

RB103.7 Roof load documentation. The structural design loads for roof dead load and roof live load shall be clearly indicated on the construction documents.

RB103.8 Interconnection pathway. Construction documents shall indicate pathways for routing of conduit or plumbing from the solar-ready zone to the electrical service panel or service hot water system.

RB103.9 Electrical service reserved space. The main electrical service panel shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

RB103.10 Construction documentation certificate. A permanent certificate, indicating the solar-ready zone and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

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APPENDIX RC
ZERO ENERGY RESIDENTIAL BUILDING PROVISIONS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User Note:

About this appendix: *This appendix provides requirements for residential buildings intended to result in net zero energy consumption over the course of a year. Where adopted by ordinance as a requirement, Section RC101 language is intended to replace Section R401.2.*

SECTION RC101
COMPLIANCE

RC101.1 Compliance. Existing residential buildings shall comply with Chapter 5. New residential buildings shall comply with Section RC102.

SECTION RC102
ZERO ENERGY RESIDENTIAL BUILDINGS

RC102.1 General. New *residential buildings* shall comply with Section RC102.2.

RC102.2 Energy Rating Index zero energy score. Compliance with this section requires that the rated design be shown to have a score less than or equal to the values in Table RC102.2 when compared to the Energy Rating Index (ERI) reference design determined in accordance with RESNET/ICC 301 for both of the following:

1. ERI value not including on-site power production (OPP) calculated in accordance with RESNET/ICC 301.
2. ERI value including on-site power production calculated in accordance with RESNET/ICC 301 with the OPP in Equation 4.1.2 of RESNET/ICC 301 adjusted in accordance with Equation RC-1.

Adjusted OPP = OPP + CREF + REPC **(Equation RC-1)**

where:

CREF = Community Renewable Energy Facility power production—the yearly energy, in kilowatt hour equivalent (kWheq), contracted from a community renewable energy facility that is qualified under applicable state and local utility statutes and rules, and that allocates bill credits to the rated home.

REPC = Renewable Energy Purchase Contract power production—the yearly energy, in kilowatt hour equivalent (kWheq), contracted from an energy facility that generates energy with photovoltaic, solar thermal, geothermal energy or wind systems, and that is demonstrated by an energy purchase contract or lease with a duration of not less than 15 years.

TABLE RC102.2
MAXIMUM ENERGY RATING INDEX[a]

CLIMATE ZONE	ENERGY RATING INDEX NOT INCLUDING OPP	ENERGY RATING INDEX INCLUDING ADJUSTED OPP (as proposed)
1	43	0
2	45	0
3	47	0
4	47	0
5	47	0
6	46	0
7	46	0
8	46	0

a. The building shall meet the requirements of Table R406.2, and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or R402.1.3 of the 2015 *International Energy Conservation Code*.

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EDITORIAL CHANGES – SECOND PRINTING

Page C3-20, **TABLE C301.1—continued:** column 1, row 41 now reads . . . 4B Catron

Page C3-36, **Section C303.1.3:** paragraph 3, lines 10 through 12 now read . . . from Table C303.1.3(3). For Tubular Daylighting Devices, VT_{annual} shall be measured and rated in accordance with NFRC 203.

Page C4-3, **TABLE C402.1.3:** column 13, row 18, line 2 now reads . . . 48

Page C4-3, **TABLE C402.1.3:** column 14, row 18, line 2 now reads . . . 24

Page C4-4, **TABLE C402.1.4:** column 1, row 7 now reads . . . Mass[f]

Page C4-4, **TABLE C402.1.4:** column 1, row 18 now reads . . . Heated slabs

Page C4-4, **TABLE C402.1.4:** column 1, row 21 now reads . . . Swinging door[g]

Page C4-4, **TABLE C402.1.4:** column 1, row 22 now reads . . . Garage door < 14% glazing[h]

Page C4-4, **TABLE C402.1.4:** Note f has been deleted

Page C4-4, **TABLE C402.1.4:** Note f now reads . . . f.“ Mass walls” shall be in accordance with Section C402.2.2.

Page C4-4, **TABLE C402.1.4:** Note g now reads . . . g. Swinging door *U*-factors shall be determined in accordance with NFRC-100.

Page C4-4, **TABLE C402.1.4:** Note h now reads . . . h. Garage doors having a single row of fenestration shall have an assembly *U*-factor less than or equal to 0.44 in Climate Zones 0 through 6 and less than or equal to 0.36 in Climate Zones 7 and 8, provided that the fenestration area is not less than 14 percent and not more than 25 percent of the total door area.

Page C4-7, **TABLE C402.3:** row 1 now reads . . . Three-year-aged solar reflectance[b] of 0.55 and 3-year aged thermal emittance[c] of 0.75

Page C4-10, **Section C402.4.4:** line 5 now reads . . . sidelit *daylight* zones.

Page C4-13, **Section C402.5.11.1:** line 2 now reads . . . comply with Section C403.14.

Page C4-37. **Section C403.4.2.3:** line 2 now reads . . . and stop controls shall be provided for each HVAC

Page C4-44. **Section C403.7.4.2:** Exception 6, line 3 now reads . . . 0, 3C, 4C, 5B, 5C, 6B, 7 and 8.

Page C4-50. new section added and now reads . . .

C403.10.6 Heat recovery for space conditioning in healthcare facilities. Where heating water is used for space heating, a condenser heat recovery system shall be installed provided that all of the following are true:

1. The building is a Group I-2, Condition 2 occupancy.
2. The total design chilled water capacity for the Group I-2,Condition 2 occupancy, either air cooled or water cooled, required at cooling design conditions exceeds 3,600,000 Btu/h (1100 kw) of cooling.
3. Simultaneous heating and cooling occurs above 60°F (16°C) outdoor air temperature.

The required heat recovery system shall have a cooling capacity that is not less than 7 percent of the total design chilled water capacity of the Group I-2, Condition 2 occupancy at peak design conditions.

Exceptions:

1. Buildings that provide 60 percent or more of their reheat energy from on-site renewable energy or site-recovered energy.
2. Buildings in Climate Zones 5C, 6B, 7 and 8.

Page C4-58, **TABLE C404.5.2.1:** column 8, row 2 now reads . . . PE-RT SDR 9

Page C4-60, **Section C405.2.1.2:** Item 2, lines 3 and 4 now read . . . unoccupied setpoint of not more than 50 percent of full power within 20 minutes after all

Page C4-60, **Section C405.2.1.4:** lines 3 and 4 now read . . . uniformly reduce lighting power to an occupied setpoint not more than 50 percent of full power within

Page C4-62, **Section C405.2.4.2:** Item 3, lines 7 through 9 now read . . . tration to the nearest full height wall, or up to 0.5 times the height from the floor to the top of the fenestration, whichever is less, as indicated

Page C4-63, **FIGURE C405.2.4.2(1)** now reads as shown

Page C4-72, **Section C405.9.2.1** now reads . . . **C405.9.2.1 Energy recovery.** Escalators shall be designed to recover electrical energy when resisting overspeed in the down direction.

Page C4-78, **Section C406.3:** section title now reads . . . **C406.3 Reduced lighting power.**

Page C4-80, **TABLE C406.1(4):** column 11, row 6 now reads . . . 1

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Page C-4-83, **TABLE C406.12(2):** column 4 now reads . . .

IDLE ENERGY RATE
400 watts
530 watts
670 watts
800 watts
6,250 Btu/h
8,350 Btu/h
10,400 Btu/h
12,500 Btu/h

Page C4-84, **TABLE C406.12(3):** column 2, row 3 now reads . . . ≤ .50 kW

Page C4-84, **TABLE C406.12(3):** column 2, row 4 now reads . . . ≤ .70 kW

Page C4-84, **Section C407.2:** Item 2, line 1 now reads . . . 2. An annual energy cost that is less than or equal to 80

Page R2-2, definition **HIGH-EFFICACY LIGHT SOURCES** now reads . . .

HIGH-EFFICACY LIGHT SOURCES. Any lamp with an efficacy of not less than 65 lumens per watt, or luminaires with an efficacy of not less than 45 lumens per watt.

Page R3-20, **TABLE R301.1—continued:** column 1, row 41 now reads . . . 4B Catron

Page R4-2, **TABLE R402.1.2:** column 4, row 7 now reads . . . 0.40

Page R4-3, **TABLE R402.1.3:** column 6 now reads . . .

WOOD FRAME WALL *R*-VALUE[g]
13 or 0&10ci
13 or 0&10ci
13 or 0&10ci
20 or 13&5ci[h] or 0&15ci[h]
30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]
30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]
30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]
30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]

Page R4-3, **TABLE R402.1.3:** column 9, row 7 now reads . . . 15ci or 19 or 13&5ci

Page R4-3, **TABLE R402.1.3:** column 11, row 7 now reads . . . 15ci or 19 or 13&5ci

Page R4-3, **TABLE R402.1.3:** column 9, row 8 now reads . . . 15ci or 19 or 13&5ci

Page R4-3, **TABLE R402.1.3:** column 11, row 8 now reads . . . 15ci or 19 or 13&5ci

Page R4-3, **TABLE R402.1.3:** column 9, row 9 now reads . . . 15ci or 19 or 13&5ci

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Page R4-3, **TABLE R402.1.3:** column 11, row 9 now reads . . . 15ci or 19 or 13&5ci

Page R4-3, **TABLE R402.1.3:** Note c, line 2 now reads . . . 19 or 13&5ci" means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation on the interior side of the wall;

Page R4-3, **TABLE R402.1.3:** Note g, line 1 now reads . . . g. The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, "13&5" means R-13 cavity insulation plus R-5

Page R4-4, **Section R402.2.1** title now reads . . . **R402.2.1 Ceilings with attics.**

Page R4-4, **Section R402.2.1:** lines 8 and 9 now read . . . ceiling or attic, installing R-49 over 100 percent of the ceiling or attic area requiring insulation shall satisfy the

Page R4-4, **Section R402.2.4.1:** lines 8 through 10 now read . . . a wood-framed or equivalent baffle, retainer, or dam shall be installed to prevent loose-fill insulation from spilling into living space from higher to lower sections

Page R4-7, **TABLE R402.4.1.1:** column 2, row 9, lines 1 and 2 now read . . . Duct and flue shafts to exterior or unconditioned space shall be sealed.

Page R4-9, **Section R402.4.1.2:** Exception 2, lines 8 and 9 now read . . . 0.2 inch w.g. (50 Pa), shall be permitted in all climate zones for:

Page R4-11, **Section R403.3.5:** new paragraph added after Item 2 now reads . . . A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*.

Page R4-11, **Section R403.3.5:** Exception line 2 now reads . . . required for ducts serving ventilation systems that are

Page R4-12, **Section R403.6** now reads . . .**R403.6 Mechanical ventilation.** The *buildings* complying with Section R402.4.1 shall be provided with ventilation that complies with the requirements of Section M1505 of the *International Residential Code* or *International Mechanical Code*, as applicable, or with other *approved* means of *ventilation*. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the *ventilation* system is not operating.

Page R4-13, **Section R404.1.1:** line 3 now reads . . . C405.5.

Page R4-13, **Section R405.2:** Item 2, line 1 now reads . . . The building thermal envelope shall be greater than

Page R4-13, **Section R405.3.2:** paragraph 2, line 2 now reads . . . dance with Sections R405.3.2.1 and R405.3.2.2.

Page R4-14, **TABLE R405.2:** column 1, row 28 now reads . . . R404.2

Page R4-16, **TABLE R405.4.2(1)—continued:** column 2, row 6, line 7 now reads . . . e_f = the minimum fan efficacy, as specified in Table 403.6.2,

Page R4-17, **TABLE R405.4.2(1)—continued:** column 2, row 2, line 2 now reads . . . Use, in units of gal/day = $25.5 + (8.5 \times N_{br})$

Page R4-17, **TABLE R405.4.2(1)—continued:** column 3, row 9, line 2 now reads . . .

Duct location: as proposed. Duct insulation: as proposed. As tested or, where not tested, as specified in Table R405.4.2(2).

Page R4-18, **Section R405.5.1:** Item 2 line 4 now reads . . . dance with Section R403.7.

Page R4-19, **TABLE R406.2:** column 1, row 27 now reads . . . R404.2

Page R4-19, **Section R406.3.2:** line 6 now reads . . . R402.1.4 of the 2018 *International Energy Conservation*

Page R4-21, **Section R408.2.3:** Item 1, line 1 now reads . . . 1. Greater than or equal to 0.82 EF fossil fuel service

Page Appendix RC-1, **TABLE RC102.2:** Note a, lines 3 and 4 now read . . . efficiency and SHGC in Table R402.1.2 or R402.1.3 of the 2015 *International Energy Conservation Code*.

For the complete errata history of this code, please visit: https://www.iccsafe.org/errata-central/

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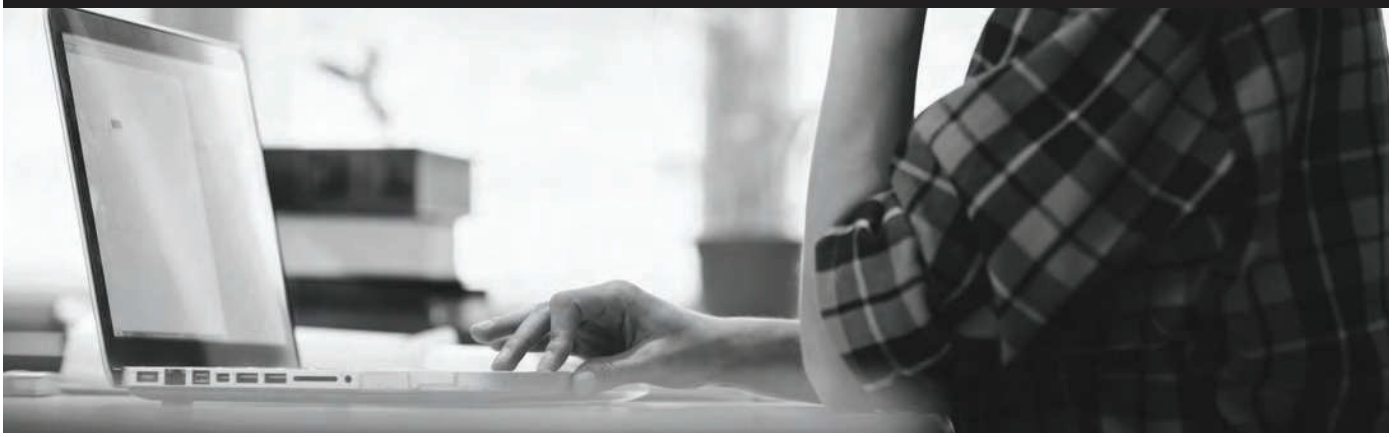
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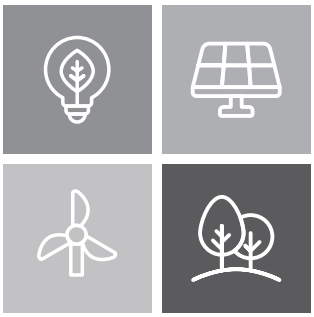
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Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Harley Gifford, Deputy City Attorney

SUBJECT: AN ORDINANCE AMENDING CHAPTER 12 OF TITLE IV OF THE PUEBLO MUNICIPAL CODE BY ADOPTING BY REFERENCE THE 2021 INTERNATIONAL ENERGY CONSERVATION CODE; AMENDING SECTIONS 4-2-1 AND 4-2-2 OF THE PUEBLO MUNICIPAL CODE TO REFLECT THE RELOCATION OF THE INTERNATIONAL ENERGY CONSERVATION CODE; AMENDING SECTION 4-1-2 OF THE PUEBLO MUNICIPAL CODE; AND PROVIDING PENALTIES AND REMEDIES FOR THE VIOLATION THEREOF

SUMMARY:

Attached is an Ordinance amending Chapter 12 of Title IV of the Pueblo Municipal Code by adopting by reference the 2021 International Energy Conservation Code. Sections C110 (Board of Appeals) and R110 (Means of Appeals) of the 2021 International Energy Conservation Code are not adopted and are expressly deleted, consistent with the existing administrative framework of the Pueblo Municipal Code, with appeals from any decision of the Building Official to be heard by the Building Board of Appeal in accordance with Sections 15(d) and 18 of the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department. The Ordinance also amends Sections 4-2-1 and 4-2-2 of the Pueblo Municipal Code to remove the existing reference to the International Energy Conservation Code in Chapter 2 of Title IV (which currently bundles that code with the International Building Code) and to repeal the existing local amendments to the International Energy Conservation Code, and amends Section 4-1-2 of the Pueblo Municipal Code to reflect the relocation. Adoption of the 2021 International Building Code under Ordinance No. 10466 is unaffected by this Ordinance.

This Ordinance is the second of two related Ordinances. The companion Ordinance, adopting the 2025 Colorado Model Electric Ready and Solar Ready Code and creating Chapter 12 of Title IV of the Pueblo Municipal Code, was previously introduced to City Council. Adoption of both Ordinances brings the City into compliance with the energy

code mandate at C.R.S. § 31-15-602(3.5)(a), which requires municipalities updating any building code between July 1, 2023 and June 30, 2026 to adopt an energy code achieving equivalent or better performance than both the 2021 International Energy Conservation Code and the model electric ready and solar ready code language adopted by the Colorado Energy Code Board.

PREVIOUS COUNCIL ACTION:

On May 22, 2023, City Council approved Ordinance No. 10466, which amended Chapter 2 of Title IV of the Pueblo Municipal Code to adopt by reference the 2021 International Building Code, the 2021 International Energy Conservation Code, and the 2021 International Existing Building Code, with local amendments. This Ordinance repeals the local amendments to the 2021 International Energy Conservation Code and re-adopts that code without amendment in Chapter 12 of Title IV. Adoption of the 2021 International Building Code under Ordinance No. 10466 is unaffected by this Ordinance.

BACKGROUND:

In 2022, the Colorado General Assembly enacted House Bill 22-1362, codified in part at C.R.S. § 31-15-602(3.5)(a), directing municipalities and counties that update any building code between July 1, 2023 and June 30, 2026 to adopt an energy code achieving equivalent or better energy performance than the 2021 International Energy Conservation Code and the model electric ready and solar ready code language adopted by the Colorado Energy Code Board.

The City currently has the 2021 International Energy Conservation Code adopted by reference under Ordinance No. 10466 (May 22, 2023) with local amendments, codified at Section 4-2-2 of the Pueblo Municipal Code. This Ordinance repeals those local amendments and re-adopts the 2021 International Energy Conservation Code in Chapter 12 of Title IV. The Ordinance carries forward, in new Section 4-12-2(b) of the Pueblo Municipal Code, the existing express deletion of Sections C110 (Board of Appeals) and R110 (Means of Appeals) of the International Energy Conservation Code, with appeals to be heard by the Building Board of Appeal in accordance with Sections 15(d) and 18 of the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department. New Section 4-12-2(c) specifies that the placeholder for the adopting jurisdiction in Sections C101.1 and R101.1 of the 2021 International Energy Conservation Code is to read “City of Pueblo, Colorado.” Both administrative amendments are administrative in nature and do not affect the energy performance of the code as adopted, and the Ordinance therefore satisfies the equivalent-or-better-performance standard at C.R.S. § 31-15-602(3.5)(a) with respect to the 2021 International Energy Conservation Code component of the dual performance requirement.

The Ordinance follows the procedures for adoption of codes by reference set forth at C.R.S. §§ 31-16-201 through 31-16-208 (“Part 2”), including the dual mayor-and-clerk certification of code copies under C.R.S. § 31-16-206 and the two-publication notice rule under C.R.S. § 31-16-203. The penalty provisions for violation of the 2021 International Energy Conservation Code as adopted by this Ordinance are set forth in full in Section 4-12-4 of the Pueblo Municipal Code, as enacted by the companion

Ordinance and as expanded by this Ordinance, in compliance with C.R.S. § 31-16-204.

Chapter 12 of Title IV of the Pueblo Municipal Code, as amended by this Ordinance, will be enforced by the Southern Colorado Building Department under the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department (Ordinance No. 11081, effective January 1, 2026), consistent with the Department's authority to enforce all building codes adopted by the City as set forth in Section 4-1-2 of the Pueblo Municipal Code as amended by Ordinance No. 11082 (effective November 26, 2025).

FINANCIAL IMPLICATIONS:

Adoption of this Ordinance, together with the previously adopted companion Ordinance, qualifies the City for grant funding under the Colorado Energy Office's building electrification and energy code adoption grant program at C.R.S. § 24-38.5-403, which provides up to two million dollars per qualifying jurisdiction to offset the costs of code adoption and enforcement. The City may apply for grant funding subsequent to adoption of this Ordinance.

The Ordinance imposes no direct cost on the City and no fee changes for permit applicants beyond those independently set by the Southern Colorado Building Commission and approved by the City and Town of Boone under the Intergovernmental Agreement.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance. The Southern Colorado Building Commission has not been asked for a formal recommendation; the code adopted by the Ordinance is the code the State of Colorado has identified for adoption to comply with C.R.S. § 31-15-602(3.5)(a), and the structural choice of placing the code in Chapter 12 of Title IV is a matter of municipal code organization rather than building code substance.

STAKEHOLDER PROCESS:

The Ordinance will be the subject of a public hearing as required by C.R.S. § 31-16-203. Notice of the public hearing will be published twice in a newspaper of general circulation in the City, with the first publication at least fifteen days before the hearing and the second at least eight days before the hearing. A certified true copy of the 2021 International Energy Conservation Code, signed by the Mayor and the City Clerk, will be filed in the office of the City Clerk at least fifteen days before the public hearing and will be open to public inspection.

ALTERNATIVES:

If this Ordinance is not approved, the City's existing local amendments to the 2021 International Energy Conservation Code under Ordinance No. 10466 (May 22, 2023) remain in force. Those amendments may not satisfy the equivalent-or-better-performance standard at C.R.S. § 31-15-602(3.5)(a) when measured against the unamended 2021 International Energy Conservation Code, exposing the City to potential challenge that the existing code does not comply with state law. The City would also remain ineligible for the Colorado Energy Office grant program at C.R.S. §

24-38.5-403 notwithstanding adoption of the companion Ordinance. Continued non-compliance does not carry an immediate penalty under state law but is inconsistent with the City's general obligation under Charter Section 3-5(i) to faithfully execute and comply with all laws of the State of Colorado that apply to the City.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. Ordinance
2. Amended 2021 IECC City of Pueblo

ORDINANCE NO. _____

AN ORDINANCE AMENDING CHAPTER 12 OF TITLE IV OF THE PUEBLO MUNICIPAL CODE BY ADOPTING BY REFERENCE THE 2021 INTERNATIONAL ENERGY CONSERVATION CODE PUBLISHED BY THE INTERNATIONAL CODE COUNCIL, INC.; AMENDING SECTIONS 4-2-1 AND 4-2-2 OF THE PUEBLO MUNICIPAL CODE TO REFLECT THE RELOCATION OF THE INTERNATIONAL ENERGY CONSERVATION CODE; AMENDING SECTION 4-1-2 OF THE PUEBLO MUNICIPAL CODE; AND PROVIDING PENALTIES AND REMEDIES FOR THE VIOLATION THEREOF

WHEREAS, the City of Pueblo, Colorado is a home rule municipality organized and existing under Article XX of the Colorado Constitution, which vests in home rule municipalities plenary authority over matters of local concern, including the adoption and enforcement of building codes; and

WHEREAS, the General Assembly of the State of Colorado enacted House Bill 22-1362 in 2022, codified in part at C.R.S. § 31-15-602(3.5)(a), which requires the governing body of any municipality that updates any building code between July 1, 2023 and June 30, 2026 to adopt an energy code that achieves equivalent or better energy performance than the 2021 International Energy Conservation Code and the model electric ready and solar ready code language adopted by the Colorado Energy Code Board; and

WHEREAS, the 2021 International Energy Conservation Code is published by the International Code Council, Inc., 500 New Jersey Avenue NW, 6th Floor, Washington, D.C. 20001, and was previously adopted by reference by the City pursuant to Ordinance No. 10466 (May 22, 2023), which adoption included local amendments codified at Section 4-2-2 of the Pueblo Municipal Code; and

WHEREAS, the City Council finds it appropriate to repeal the existing local amendments to the 2021 International Energy Conservation Code and re-adopt that code by reference in Chapter 12 of Title IV of the Pueblo Municipal Code, in order to fully satisfy the dual performance requirement of C.R.S. § 31-15-602(3.5)(a); and

WHEREAS, the City Council finds it appropriate to expressly delete Sections C110 (Board of Appeals) and R110 (Means of Appeals) of the 2021 International Energy Conservation Code, consistent with the longstanding administrative framework of Pueblo Municipal Code Section 4-2-1, with appeals from any decision of the Building Official under the 2021 International Energy Conservation Code to be heard by the Building Board of Appeal established under Section 15(d) of the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department in accordance with the procedures set forth in Section 18 of that Agreement, and to specify that the placeholder for the adopting jurisdiction in Sections C101.1 and R101.1 of the 2021 International Energy Conservation Code shall be deemed to read “City of Pueblo, Colorado,” neither

of which administrative amendments affects the energy performance of the code as adopted; and

WHEREAS, the procedures and requirements for adoption of codes by reference set forth at C.R.S. §§ 31-16-201 through 31-16-208 have been complied with, including the filing of a certified true copy of the 2021 International Energy Conservation Code in the office of the City Clerk at least fifteen days preceding the public hearing on this Ordinance, and the publication of notice of the public hearing twice in a newspaper of general circulation in the City of Pueblo as required by C.R.S. § 31-16-203; and

WHEREAS, the penalty clauses applicable to violations of the code adopted by reference in this Ordinance are set forth in full in Section 4-12-4 of the Pueblo Municipal Code as expanded by this Ordinance, as required by C.R.S. § 31-16-204; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Section 4-12-2 of the Pueblo Municipal Code, currently reading "Reserved," is amended to read as follows:

Sec. 4-12-2. Adoption of 2021 International Energy Conservation Code by reference.

(a) The 2021 International Energy Conservation Code, published by the International Code Council, Inc., 500 New Jersey Avenue NW, 6th Floor, Washington, D.C. 20001, is hereby adopted by reference as the energy conservation code of the City of Pueblo. One copy of the 2021 International Energy Conservation Code, certified to be a true copy by the Mayor and the City Clerk, is on file in the office of the City Clerk and is open to public inspection. After the effective date of this Ordinance, a copy may be kept in the office of the Building Official as the chief enforcement officer in lieu of the office of the City Clerk.

(b) Notwithstanding the adoption by reference in subsection (a), Sections C110, entitled "Board of Appeals," and R110, entitled "Means of Appeals," of the 2021 International Energy Conservation Code are not adopted and are expressly deleted. Appeals from any decision of the Building Official under the 2021 International Energy Conservation Code shall be filed with and decided by the Building Board of Appeal established under Section 15(d) of the Intergovernmental Agreement for the Operation of the Southern Colorado Building Department, in accordance with the procedures set forth in Section 18 of that Agreement.

(c) The name of the jurisdiction for purposes of Sections C101.1 and R101.1 of the 2021 International Energy Conservation Code is "City of Pueblo, Colorado."

SECTION 2.

Section 4-12-4 of the Pueblo Municipal Code, entitled “Penalties,” is amended to read as follows:

(a) Any person, firm, or corporation that violates any provision of the **2021 International Energy Conservation Code or the** 2025 Colorado Model Electric Ready and Solar Ready Code as adopted by this Chapter, or any administrative provision related thereto, commits an offense punishable as provided in Section 1-2-1 of this Code. Each day during which a violation continues constitutes a separate offense.

Subsections (b) and (c) of Section 4-12-4 are unchanged.

SECTION 3.

Section 4-2-1 of the Pueblo Municipal Code is amended to read as follows:

Sec. 4-2-1. International Building Code; adoption by reference.

(a) The International Building Code, 2021 edition, promulgated and published by the International Code Council, Inc., 4051 Flossmoor Road, Country Club Hills, IL 60478, together with the following Appendices: Appendix C (Group U Agricultural Buildings); Appendix H (Signs); and Appendix I (Patio Covers), hereinafter collectively referred to as the “International Building Code” or “I.B.C.,” **[**together with the minor codes entitled “International Energy Conservation Code,” 2021 Edition, promulgated and published by the International Code Council, Inc., 4051 Flossmoor Road, Country Club Hills, IL 60478, hereinafter referred to as the “I.E.C.C.,”**]** and the International Existing Building Code 2021 Edition, promulgated and published by the International Code Council, Inc., 4051 Flossmoor Road, Country Club Hills, IL 60478, hereinafter referred to as the “I.E.B.C.,” as amended by this Chapter, are adopted by reference; provided, however, that **[**Sections C110, entitled “Board of Appeals,” and R110, entitled “Means of Appeals” of the I.E.C.C. are not adopted and are expressly deleted. In addition,**]**Sections 112 entitled “Means of Appeals,” 406 entitled “Electrical,” 408 entitled “Plumbing,” 808 entitled “Plumbing”,” 806 entitled “Electrical,” 1007 “Electrical” and 1009 entitled “Plumbing” of the I.E.B.C. are expressly deleted.

(b) Copies of the I.B.C., I.E.B.C. **[**and I.E.C.C.**]** are available in the office of the Southern Colorado Building Department for distribution and sale to the public. The erection, construction, enlargement, alteration, repair, moving, removal, demolition, conversion, occupancy, equipment, use, height, area and maintenance of all buildings and structures within the City shall be in compliance with the terms and provisions of this Chapter and the I.B.C., I.E.B.C. **[**and the I.E.C.C.**]**.

SECTION 4.

Section 4-2-2 of the Pueblo Municipal Code is amended by repealing in their entirety the title and subsections (y), (z), (aa), (bb), and (cc) thereof, and amending the section heading, to read as follows:

Sec. 4-2-2. Amendments, IBC [and IECC].
Subsections (a) through (x) of Section 4-2-2, containing amendments to the International Building Code, remain unchanged and in full force and effect. The following subsections are repealed:

[(y) IECC Table C402.1.3, entitled “Opaque Thermal Envelope Insulation Component Minimum Requirements, R-Value Method” is amended to read as follows:

	5 AND MARINE 4	**5 AND MARINE 4**
	All Other	**Group R**
Insulation entirely above roof deck	R-30ci	R-30ci
Metal buildings	R-19 + R-11 LS	R-19 + R-11 LS
Attic and other	R-38	R-49
	Walls, above grade	**Walls, above grade**
Mass	R-11.4ci	R-13.3ci
Metal building	R-13 + 13ci	R-13 + R-13ci
Metal framed	R-13 + R7.5ci	R-13 + R-7.5ci
Wood framed and other	R-13 + R-3.8ci or R20	R-13 + R-7.5ci or R-20 + R-3.8ci
	Walls, below grade	**Walls, below grade**
Below-grade wall	R-7.5ci	R-7.5ci
	Floors	**Floors**
Mass	R-10ci	R-12ci
Joist/framing	R-30	R-30
	Slab-on-grade floors	**Slab-on-grade floors**
Unheated slabs	R-10 for 24" below	R-10 for 24" below
Heated slabs	R-15 for 36" below + R-5 full slab	R-15 for 36" below + R-5 full slab

]

[(z) IECC Table C402.4 entitled “Building Envelope Fenestration Maximum U-Factor and SHGC Requirements”, is amended to read as follows:

CLIMATE ZONE	**5 AND MARINE 4**
Vertical fenestration	**Vertical fenestration**
U-factor	**U-factor**
Fixed fenestration	.38

Operable Fenestration	0.45
Entrance doors	.77

]

[(aa) Table R402.1.2, entitled “Maximum Assembly U-Factors a and Fenestration Requirements” of the IECC is amended to read as follows:

Climate Zone	Fenestration U-Factor f	Skylight U-Factor	Glazed Fenestration SHGC d	Ceiling U-Factor	Wood Frame Wall U-Factor	Mass Wall U-Factor b	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
5 And Marine 4	0.32	0.55	0.40	0.026	0.06	0.082	0.033	0.050	0.055

Footnotes:

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

b. Mass wall shall be in accordance with Section 402.2.5 where more than half of the insulation is on the interior, the mass wall U-factors shall not exceed 0.065 in Climate Zone 5 and Marine 4.

d. The SHCG column applies to all glazed fenestration.

f. A maximum U-factor of 0.32 shall apply in Climate Zone 5-8 to vertical fenestration products installed in buildings located above 4,000 feet in elevation above sea level.**]**

[(bb) Table R402.1.3, entitled “Insulation Minimum R-Values and Fenestration Requirements by Components” of the IECC is amended to read as follows:

Climate Zone	Fenestration U-Factor b, i	Skylight U-Factor b	Glazed Fenestration SHGC b	Ceiling U-Factor	Wood Frame Wall U-Factor g	Mass Wall U-Factor h	Floor U-Factor	Basement Wall R-Value c,g	Slab R-Value & Depth d	Crawl Space Wall U-Factor c,g
5 And Marine 4	0.32 i	0.55	0.40	49	20 h or 13 + 5ci h	13/17	30	15ci or 19 or 13 & 5ci	2f	15ci or 19 or 13 & 5ci

Footnotes:

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

b. The fenestration U-factor columns excludes skylights. The SHGC applies to all glazed fenestration.

c. “5ci or 13” means R-5 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. “10ci or 13” means R-10 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. “15ci or 19 or 13&5ci” means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation on the interior side of the wall; or R-13 cavity insulation on the interior of the wall in addition to R-5 continuous insulation on the interior or exterior surface of the wall.

d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs as indicated in the table. The slab-edge insulation for heated slabs shall not be required to extend below the slab.

g. The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, “13&5” means R-13 cavity insulation plus R-5 continuous insulation.

h. Mass walls shall be in accordance with Section R402.2.5. The second R-value applies where more than half (0.5) of the insulation is on the interior of the mass wall.

i. A maximum U-factor of 0.32 shall apply in Climate Zones 3 through 8 to vertical fenestration products installed in buildings located above four thousand feet (4,000 ft) in elevation.**]**

[(cc) Section R404.1, entitled “Lighting equipment”, of the IECC is amended to read as follows:

R404.1 Lighting equipment. Not less than ninety percent (90%) of all permanently installed fixtures, excluding kitchen appliance lighting fixtures, shall contain high-efficiency lighting sources.**]**

SECTION 5.

Section 4-1-2(f) of the Pueblo Municipal Code is amended to read as follows:

(f) *Minor or secondary codes* means any other building code which is adopted by reference, directly or indirectly, in whole or in part by ordinance or by express provisions of a major code including without limitation, the Unsafe Structures Regulations, Chapter 7 of this Title, herein Unsafe Structures Regulations; the International Property Maintenance Code as adopted with amendments by Chapter 1 of Title VIII of this Code, herein International Property Maintenance Code; and the International Energy Conservation Code **as adopted by Chapter 12 of this Title, herein International Energy Conservation Code**; and the Colorado Model Electric Ready and Solar Ready Code as adopted by Chapter 12 of this Title, herein Colorado Model Electric Ready and Solar Ready Code.

SECTION 6.

Section 4-6-2 of the Pueblo Municipal Code is amended by repealing in their entirety the title and subsections (o), (p), and (q) thereof, and amending the section heading, to read as follows:

Sec. 4-6-2. Amendments.

Subsections (a) through (n) of Section 4-6-2, containing amendments to the International Residential Code, remain unchanged and in full force and effect. The following subsections are repealed:

[(o) Table R1102.1.2 (R402.1.2), entitled "Maximum Assembly U-Factors a and Fenestration Requirements" is amended to read as follows:

Climate Zone	Fenestration U-Factor f	Skylight U-Factor	Glazed Fenestration SHGC d,e	Ceiling U-Factor	Wood Frame Wall U-Factor	Mass Wall U-Factor b	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
5 And Marine 4	0.32	0.55	0.40	0.026	0.06	0.082	0.033	0.050	0.055

Footnotes:

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

b. Mass wall shall be in accordance with Section 402.2.5 where more than half of the insulation is on the interior, the mass wall U-factors shall not exceed 0.065 in Climate Zone 5 and Marine 4.

d. The SHCG column applies to all glazed fenestration.

f. A maximum U-factor of 0.32 shall apply in Climate Zone 5-8 to vertical fenestration products installed in buildings located above 4,000 feet in elevation above sea level.**]**

[(p) Table N1102.1.3 (R402.1.3), entitled "Insulation Minimum R-Values and Fenestration Requirements by Components" a is amended to read as follows:

Climate Zone	Fenestration U-Factor b, i	Skylight U-Factor b	Glazed Fenestration SHGC b,e	Ceiling U-Factor	Wood Frame Wall U-Factor g	Mass Wall U-Factor h	Floor U-Factor	Basement Wall R-Value c,g	Slabd R-Value &Amp; Depth	Crawl Space Wall U-Factor c,g
5 And Marine 4	0.32	0.55	0.40	49	20 h or 13 + 5ci h	13/17	30	15ci or 19 or 13&5ci	10ci 2f	15ci or 19 or 13&5ci

Footnotes:

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

b. The fenestration U-factor columns excludes skylights. The SHGC applies to all glazed fenestration.

c. "5ci or 13" means R-5 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "10ci or 13" means R-10 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "15ci or 19 or 13&5ci" means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation

on the interior side of the wall; or R-13 cavity insulation on the interior of the wall in addition to R-5 continuous insulation on the interior or exterior surface of the wall.

d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs. as indicated in the table. The slab-edge insulation for heated slabs shall not be required to extend below the slab.

g. The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, "13&5" means R-13 cavity insulation plus R-5 continuous insulation.

h. Mass walls shall be in accordance with Section R402.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.

i. A maximum U-factor of 0.32 shall apply in Climate Zones 3 through 8 to vertical fenestration products installed in buildings located above 4,000 feet in elevation.**]**

[(q) Section N1104.1 (R404.1) of the I.R.C., entitled "Lighting equipment" is amended to read as follows:

"Not less than nintey percent (90%) of all permanently installed lighting fixtures, excluding kitchen appliance lighting fixtures, shall contain high-efficiency lighting sources."**]**

SECTION 7.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance to effectuate the policies and procedures described herein, including without limitation the certification of a true copy of the 2021 International Energy Conservation Code by the Mayor and the City Clerk in accordance with C.R.S. § 31-16-206, the publication of notice of the public hearing in accordance with C.R.S. § 31-16-203, and the publication of this Ordinance in full following adoption in accordance with C.R.S. § 31-16-205.

SECTION 8.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on_____

☐ Council action on _____failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

IECC®

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2021

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PREFACE

Introduction

The *International Energy Conservation Code*® (IECC®) establishes minimum requirements for energy-efficient buildings using prescriptive and performance-related provisions. It is founded on broad-based principles that make possible the use of new materials and new energy-efficient designs. This 2021 edition is fully compatible with all of the International Codes® (I-Codes®) published by the International Code Council® (ICC®), including the *International Building Code*® (IBC®), *International Existing Building Code*® (IEBC®), *International Fire Code*® (IFC®), *International Fuel Gas Code*® (IFGC®), *International Green Construction Code*® (IgCC®), *International Mechanical Code*® (IMC®), *International Plumbing Code*® (IPC®), *International Private Sewage Disposal Code*® (IPSDC®), *International Property Maintenance Code*® (IPMC®), *International Residential Code*® (IRC®), *International Swimming Pool and Spa Code*® (ISPSC®), *International Wildland-Urban Interface Code*® (IWUIC®), *International Zoning Code*® (IZC®) and *International Code Council Performance Code*® (ICCPC®).

This code contains separate provisions for commercial buildings and for low-rise residential buildings (3 stories or less in height above grade). Each set of provisions, IECC—Commercial Provisions and IECC—Residential Provisions, is separately applied to buildings within its respective scope. Each set of provisions is to be treated separately. Each contains a Scope and Administration chapter, a Definitions chapter, a General Requirements chapter, a chapter containing energy efficiency requirements and an Existing Buildings chapter containing provisions applicable to buildings within its scope.

The I-Codes, including the IECC, are used in a variety of ways in both the public and private sectors. Most industry professionals are familiar with the I-Codes as the basis of laws and regulations in communities across the US and in other countries. However, the impact of the codes extends well beyond the regulatory arena, as they are used in a variety of nonregulatory settings, including:

- Voluntary compliance programs such as those promoting sustainability, energy efficiency and disaster resistance.
- The insurance industry, to estimate and manage risk, and as a tool in underwriting and rate decisions.
- Certification and credentialing of individuals involved in the fields of building design, construction and safety.
- Certification of building and construction-related products.
- US federal agencies, to guide construction in an array of government-owned properties.
- Facilities management.
- “Best practices” benchmarks for designers and builders, including those who are engaged in projects in jurisdictions that do not have a formal regulatory system or a governmental enforcement mechanism.
- College, university and professional school textbooks and curricula.
- Reference works related to building design and construction.

In addition to the codes themselves, the code development process brings together building professionals on a regular basis. It provides an international forum for discussion and deliberation about building design, construction methods, safety, performance requirements, technological advances and innovative products.

Development

This 2021 edition presents the code as originally issued, with changes reflected in the 2000 through 2018 editions and further changes approved through the ICC Code Development Process through 2019. A new edition such as this is promulgated every 3 years.

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This code is founded on principles intended to establish provisions consistent with the scope of an energy conservation code that adequately conserves energy; provisions that do not unnecessarily increase construction costs; provisions that do not restrict the use of new materials, products or methods of construction; and provisions that do not give preferential treatment to particular types or classes of materials, products or methods of construction.

Maintenance

The IECC is kept up to date through the review of proposed changes submitted by code enforcement officials, industry representatives, design professionals and other interested parties. Proposed changes are carefully considered through an open code development process in which all interested and affected parties may participate.

The ICC Code Development Process reflects principles of openness, transparency, balance, due process and consensus, the principles embodied in OMB Circular A-119, which governs the federal government's use of private-sector standards. The ICC process is open to anyone; there is no cost to participate, and people can participate without travel cost through the ICC's cloud-based app, cdpACCESS®. A broad cross-section of interests are represented in the ICC Code Development Process. The codes, which are updated regularly, include safeguards that allow for emergency action when required for health and safety reasons.

In order to ensure that organizations with a direct and material interest in the codes have a voice in the process, the ICC has developed partnerships with key industry segments that support the ICC's important public safety mission. Some code development committee members were nominated by the following industry partners and approved by the ICC Board:

- National Association of Home Builders (NAHB)
- National Multifamily Housing Council (NMHC)

The code development committees evaluate and make recommendations regarding proposed changes to the codes. Their recommendations are then subject to public comment and council-wide votes. The ICC's governmental members—public safety officials who have no financial or business interest in the outcome—cast the final votes on proposed changes.

The contents of this work are subject to change through the code development cycles and by any governmental entity that enacts the code into law. For more information regarding the code development process, contact the Codes and Standards Development Department of the ICC.

While the I-Code development procedure is thorough and comprehensive, the ICC, its members and those participating in the development of the codes disclaim any liability resulting from the publication or use of the I-Codes, or from compliance or noncompliance with their provisions. The ICC does not have the power or authority to police or enforce compliance with the contents of this code.

Code Development Committee Responsibilities (Letter Designations in Front of Section Numbers)

In each code development cycle, proposed changes to this code are considered at the Committee Action Hearings by the applicable International Code Development Committee. The IECC—Commercial Provisions (sections designated with a "C" prior to the section number) are primarily maintained by the Commercial Energy Code Development Committee. The IECC—Residential Provisions (sections designated with an "R" prior to the section number) are maintained by the Residential Energy Code Development Committee. This is designated in the chapter headings by a [CE] and [RE], respectively.

Maintenance responsibilities for the IECC are designated as follows:

[CE] = International Commercial Energy Conservation Code Development Committee

[RE] = International Residential Energy Conservation Code Development Committee

For the development of the 2024 edition of the I-Codes, there will be two groups of code development committees and they will meet in separate years, as shown in the following Code Development Hearings Table.

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Code change proposals submitted for code sections that have a letter designation in front of them will be heard by the respective committee responsible for such code sections. Because different committees hold Committee Action Hearings in different years, proposals for several I-Codes will be heard by committees in both the 2021 (Group A) and the 2022 (Group B) code development cycles.

All code change proposals for the IECC are considered in the Group B hearings.

It is very important that anyone submitting code change proposals understands which code development committee is responsible for the section of the code that is the subject of the code change proposal. For further information on the Code Development Committee responsibilities, please visit the ICC website at www.iccsafe.org/current-code-development-cycle.

CODE DEVELOPMENT HEARINGS

Group A Codes (Heard in 2021, Code Change Proposals Deadline: January 11, 2021)	Group B Codes (Heard in 2022, Code Change Proposals Deadline: January 10, 2022)
International Building Code – Egress (Chapters 10, 11, Appendix E) – Fire Safety (Chapters 7, 8, 9, 14, 26) – General (Chapters 2–6, 12, 27–33, Appendices A, B, C, D, K, N)	Administrative Provisions (Chapter 1 of all codes except IECC, IRC and IgCC; IBC Appendix O; the appendices titled "Board of Appeals" for all codes except IECC, IRC, IgCC, ICCPC and IZC; administrative updates to currently referenced standards; and designated definitions)
International Fire Code	**International Building Code** – Structural (Chapters 15–25, Appendices F, G, H, I, J, L, M)
International Fuel Gas Code	**International Existing Building Code**
International Mechanical Code	**International Energy Conservation Code—Commercial**
International Plumbing Code	**International Energy Conservation Code—Residential** – IECC—Residential – IRC—Energy (Chapter 11)
International Property Maintenance Code	**International Green Construction Code** (Chapter 1)
International Private Sewage Disposal Code	**International Residential Code** – IRC—Building (Chapters 1–10, Appendices AE, AF, AH, AJ, AK, AL, AM, AO, AQ, AR, AS, AT, AU, AV, AW)
International Residential Code – IRC—Mechanical (Chapters 12–23) – IRC—Plumbing (Chapters 25–33, Appendices AG, AI, AN, AP)	
International Swimming Pool and Spa Code	
International Wildland-Urban Interface Code	
International Zoning Code	

Note: Proposed changes to the ICCPC will be heard by the code development committee noted in brackets [ ] in the text of the ICCPC.

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Marginal Markings

Solid vertical lines in the margins within the body of the code indicate a technical change from the requirements of the 2018 edition. Deletion indicators in the form of an arrow (➡) are provided in the margin where an entire section, exception or table has been deleted or an item in a list of items or row of a table has been deleted.

A single asterisk [*] placed in the margin indicates that text or a table has been relocated within the code. A double asterisk [**] placed in the margin indicates that the text or table immediately following it has been relocated there from elsewhere in the code. The following tables indicate such relocations in the 2021 edition of the IECC.

IECC COMMERCIAL RELOCATIONS

2021 LOCATION	2018 LOCATION
C402.2.1.5	C402.2.1.1
C404.6.1.1	C404.7
C405.2.3.1	C405.2.2.2
C405.2.4	C405.2.3
C501.2	C501.4
C503.2.2.1	C401.2.1

IECC RESIDENTIAL RELOCATIONS

2021 LOCATION	2018 LOCATION
Table R402.1.2	Table R402.1.4
Table R402.1.3	Table R402.1.2
R403.3.2	R403.3.7
R403.3.3	R403.3.6
R403.3.3.1	R403.3.6.1
R403.3.4	R403.3.2
R403.3.4.1	R403.3.2.1
R403.3.5	R403.3.3
R403.3.6	R403.3.4
R403.3.7	R403.3.5

Coordination of the International Codes

The coordination of technical provisions is one of the strengths of the ICC family of model codes. The codes can be used as a complete set of complementary documents, which will provide users with full integration and coordination of technical provisions. Individual codes can also be used in subsets or as stand-alone documents. To make sure that each individual code is as complete as possible, some technical provisions that are relevant to more than one subject area are duplicated in some of the model codes. This allows users maximum flexibility in their application of the I-Codes.

Italicized Terms

Terms italicized in code text, other than document titles, are defined in Chapter 2. The terms selected to be italicized have definitions that the user should read carefully to better understand the code. Where italicized, the Chapter 2 definition applies. If not italicized, common-use definitions apply.

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Adoption

The ICC maintains a copyright in all of its codes and standards. Maintaining copyright allows the ICC to fund its mission through sales of books, in both print and electronic formats. The ICC welcomes adoption of its codes by jurisdictions that recognize and acknowledge the ICC's copyright in the code, and further acknowledge the substantial shared value of the public/private partnership for code development between jurisdictions and the ICC.

The ICC also recognizes the need for jurisdictions to make laws available to the public. All I-Codes and I-Standards, along with the laws of many jurisdictions, are available for free in a non-downloadable form on the ICC's website. Jurisdictions should contact the ICC at adoptions@iccsafe.org to learn how to adopt and distribute laws based on the IECC in a manner that provides necessary access, while maintaining the ICC's copyright.

To facilitate adoption, two sections of this code contain blanks for fill-in information that needs to be supplied by the adopting jurisdiction as part of the adoption legislation. For this code, please see:

Section C101.1. Insert: **[NAME OF JURISDICTION]**.

Section R101.1. Insert: **[NAME OF JURISDICTION]**.

Effective Use of the International Energy Conservation Code

The IECC is a model code that regulates minimum energy conservation requirements for new buildings. The IECC addresses energy conservation requirements for all aspects of energy use in both commercial and residential construction, including heating and ventilating, lighting, water heating, and power usage for appliances and building systems.

The IECC is a design document. For example, before one constructs a building, the designer must determine the minimum insulation *R*-values and fenestration *U*-factors for the building exterior envelope. Depending on whether the building is for residential use or for commercial use, the IECC sets forth minimum requirements for exterior envelope insulation, window and door *U*-factors and SHGC ratings, duct insulation, lighting and power efficiency, and water distribution insulation.

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ARRANGEMENT AND FORMAT OF THE 2021 IECC

The IECC contains two separate sets of provisions—one for commercial buildings and one for residential buildings. Each set of provisions is applied separately to buildings within their scope. The IECC—Commercial Provisions apply to all buildings except for residential buildings three stories or less in height. The IECC—Residential Provisions apply to detached one- and two-family dwellings and multiple single-family dwellings as well as Group R-2, R-3 and R-4 buildings three stories or less in height. These scopes are based on the definitions of "Commercial building" and "Residential building," respectively, in Chapter 2 of each set of provisions. Note that the IECC—Commercial Provisions therefore contain provisions for residential buildings four stories or greater in height.

The following table shows how the IECC is divided. The ensuing chapter-by-chapter synopsis details the scope and intent of the provisions of the IECC.

Chapter Topics

Chapter	Subjects
1–2	Administration and definitions
3	Climate zones and general materials requirements
4	Energy efficiency requirements
5	Existing buildings
6	Referenced standards
CA	Board of appeals
CB	Solar-ready zone
CC	Net zero energy

Chapter 1 Scope and Administration

Chapters 1 [CE] and 1 [RE] contain provisions for the application, enforcement and administration of subsequent requirements of the code. In addition to establishing the scope of the code, Chapter 1 identifies which buildings and structures come under its purview. Chapter 1 is largely concerned with maintaining "due process of law" in enforcing the energy conservation criteria contained in the body of this code. Only through careful observation of the administrative provisions can the code official reasonably expect to demonstrate that "equal protection under the law" has been provided.

Chapter 2 Definitions

Terms that are defined in the code are listed alphabetically in Chapters 2 [CE] and 2 [RE]. While a defined term may be used in one chapter or another, the meaning provided in Chapter 2 is applicable throughout the code.

Additional definitions regarding climate zones are found in Tables C301.3 and R301.3. These are not listed in Chapter 2.

Where understanding of a term's definition is especially key to or necessary for understanding of a particular code provision, the term is shown in italics. This is true only for those terms that have a meaning that is unique to the code. In other words, the generally understood meaning of a term or phrase might not be sufficient or consistent with the meaning prescribed by the code; therefore, it is essential that the code-defined meaning be known.

Guidance regarding tense, gender and plurality of defined terms as well as guidance regarding terms not defined in this code is provided.

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Chapter 3 General Requirements

Chapters 3 [CE] and 3 [RE] specify the climate zones that will serve to establish the exterior design conditions. In addition, Chapter 3 provides interior design conditions that are used as a basis for assumptions in heating and cooling load calculations, and provides basic material requirements for insulation materials and fenestration materials. Climate has a major impact on the energy use of most buildings. The code establishes many requirements such as wall and roof insulation *R*-values, window and door thermal transmittance (*U*-factors) and provisions that affect the mechanical systems based on the climate where the building is located. This chapter contains information that will be used to properly assign the building location into the correct climate zone and is used as the basis for establishing or eliminating requirements.

Chapter 4 Energy Efficiency

Chapter 4 [CE] contains the energy-efficiency-related requirements for the design and construction of most types of commercial buildings and residential buildings greater than three stories in height above grade. This chapter defines requirements for the portions of the building and building systems that impact energy use in new commercial construction and new residential construction greater than three stories in height, and promotes the effective use of energy. In addition to energy conservation requirements for the building envelope, this chapter contains requirements that impact energy efficiency for the HVAC systems, the electrical systems and the plumbing systems. It should be noted, however, that requirements are contained in other codes that have an impact on energy conservation. For instance, requirements for water flow rates are regulated by the *International Plumbing Code*.

Chapter 4 [RE] contains the energy-efficiency-related requirements for the design and construction of residential buildings regulated under this code. It should be noted that the definition of a residential building in this code is unique for this code. In this code, residential buildings include detached one- and two-family dwellings and multiple single-family dwellings as well as R-2, R-3 or R-4 buildings three stories or less in height. All other buildings, including residential buildings greater than three stories in height, are regulated by the energy conservation requirements in the IECC—Commercial Provisions. The applicable portions of a residential building must comply with the provisions within this chapter for energy efficiency. This chapter defines requirements for the portions of the building and building systems that impact energy use in new residential construction and promotes the effective use of energy. The provisions within the chapter promote energy efficiency in the building envelope, the heating and cooling system and the service water-heating system of the building.

Chapter 5 Existing Buildings

Chapters 5 [CE] and [RE] contain the technical energy efficiency requirements for existing buildings. Chapter 5 provisions address the maintenance of buildings in compliance with the code as well as how additions, alterations, repairs and changes of occupancy need to be addressed from the standpoint of energy efficiency. Specific provisions are provided for historic buildings.

Chapter 6 Referenced Standards

The code contains numerous references to standards that are used to regulate materials and methods of construction. Chapters 6 [CE] and 6 [RE] list all standards referenced in their respective portions of the code. The standards are part of the code to the extent of the reference to the standard. Compliance with the referenced standard is necessary for compliance with this code. By providing specifically adopted standards, the construction and installation requirements necessary for compliance with the code can be readily determined. The basis for code compliance is, therefore, established and available on an equal basis to the code official, contractor, designer and owner.

Chapter 6 is organized in a manner that makes it easy to locate specific standards. It lists all of the referenced standards, alphabetically, by acronym of the promulgating agency of the standard. Each agency's standards are then listed in either alphabetical or numeric order based on the standard identification. The list also contains the title of the standard; the edition (date) of the standard referenced; any addenda included as part of the ICC adoption; and the section or sections of this code that reference the standard.

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Appendices

The appendices, while not part of the code, can become part of the code when specifically included in the adopting ordinance.

Chapter 1 requires the establishment of a board of appeals to hear appeals regarding determinations made by the code official. Appendices CA and RA provide qualification standards for members of the board as well as operational procedures of such board.

Appendices CB and RB address provisions for solar capacity in new structures.

Appendices CC and RC provide requirements intended bring about net zero annual energy consumption in their respective structures.

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ABBREVIATIONS AND NOTATIONS

The following table contains a list of common abbreviations and units of measurement used in this code. Some of the abbreviations are for terms defined in Chapter 2. Others are terms used in various tables and text of the code.

Abbreviations and Notations

AFUE	Annual fuel utilization efficiency
bhp	Brake horsepower (fans)
Btu	British thermal unit
Btu/h × ft^2	Btu per hour per square foot
C-factor	See Chapter 2—Definitions
CDD	Cooling degree days
cfm	Cubic feet per minute
cfm/ft^2	Cubic feet per minute per square foot
ci	Continuous insulation
COP	Coefficient of performance
DCV	Demand control ventilation
°C	Degrees Celsius
°F	Degrees Fahrenheit
DWHR	Drain water heat recovery
DX	Direct expansion
E_c	Combustion efficiency
E_v	Ventilation efficiency
E_t	Thermal efficiency
EER	Energy efficiency ratio
EF	Energy factor
ERI	Energy rating index
F-factor	See Chapter 2—Definitions
FDD	Fault detection and diagnostics
FEI	Fan energy index
FL	Full load
ft^2	Square foot
gpm	Gallons per minute
HDD	Heating degree days
hp	Horsepower
HSPF	Heating seasonal performance factor
HVAC	Heating, ventilating and air conditioning

(continued)

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Abbreviations and Notations—continued

IEER	Integrated energy efficiency ratio
IPLV	Integrated Part Load Value
Kg/m^2	Kilograms per square meter
kW	Kilowatt
LPD	Light power density (lighting power allowance)
L/s	Liters per second
Ls	Liner system
m^2	Square meters
MERV	Minimum efficiency reporting value
NAECA	National Appliance Energy Conservation Act
NPLV	Nonstandard Part Load Value
Pa	Pascal
PF	Projection factor
pcf	Pounds per cubic foot
psf	Pounds per square foot
PTAC	Packaged terminal air conditioner
PTHP	Packaged terminal heat pump
R-value	See Chapter 2—Definitions
SCOP	Sensible coefficient of performance
SEER	Seasonal energy efficiency ratio
SHGC	Solar Heat Gain Coefficient
SPVAC	Single packaged vertical air conditioner
SPVHP	Single packaged vertical heat pump
SRI	Solar reflectance index
SWHF	Service water heat recovery factor
U-factor	See Chapter 2—Definitions
VAV	Variable air volume
VRF	Variable refrigerant flow
VT	Visible transmittance
W	Watts
w.c.	Water column
w.g.	Water gauge

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CHAPTER 1 [CE]
SCOPE AND ADMINISTRATION

User note:

About this chapter: *Chapter 1 establishes the limits of applicability of the code and describes how the code is to be applied and enforced. Chapter 1 is in two parts: Part 1—Scope and Application and Part 2—Administration and Enforcement. Section C101 identifies what buildings, systems, appliances and equipment fall under its purview and references other I-Codes as applicable. Standards and codes are scoped to the extent referenced.*

The code is intended to be adopted as a legally enforceable document and it cannot be effective without adequate provisions for its administration and enforcement. The provisions of Chapter 1 establish the authority and duties of the code official appointed by the authority having jurisdiction and also establish the rights and privileges of the design professional, contractor and property owner.

PART 1—SCOPE AND APPLICATION

SECTION C101
SCOPE AND GENERAL REQUIREMENTS

C101.1 Title. This code shall be known as the *Energy Conservation Code* of **the City of Pueblo, Colorado** , and shall be cited as such. It is referred to herein as "this code."

C101.2 Scope. This code applies to *commercial buildings* and the buildings' sites and associated systems and equipment.

C101.3 Intent. This code shall regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

C101.4 Applicability. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

C101.4.1 Mixed residential and commercial buildings. Where a building includes both *residential building* and *commercial building* portions, each portion shall be separately considered and meet the applicable provisions of IECC—Commercial Provisions or IECC—Residential Provisions.

C101.5 Compliance. *Residential buildings* shall meet the provisions of IECC—Residential Provisions. *Commercial buildings* shall meet the provisions of IECC—Commercial Provisions.

C101.5.1 Compliance materials. The *code official* shall be permitted to approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code.

SECTION C102
ALTERNATIVE MATERIALS, DESIGN AND METHODS OF CONSTRUCTION AND EQUIPMENT

C102.1 General. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. The code official shall have the authority to approve an alternative material, design or method of construction upon the written application of the owner or the owner's authorized agent. The *code official* shall first find that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability, energy conservation and safety. The *code official* shall respond to the applicant, in writing, stating the reasons why the alternative was approved or was not *approved*.

C102.1.1 Above code programs. The *code official* or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program as exceeding the energy efficiency required by this code. Buildings *approved* in writing by such an energy efficiency program shall be considered to be in compliance with this code. The requirements identified in Table C407.2 shall be met.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION C103
CONSTRUCTION DOCUMENTS

C103.1 General. Construction documents and other supporting data shall be submitted in one or more sets, or in a digital format where allowed by the building official, with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction

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documents to be prepared by a registered design professional.

Exception: The *code official* is authorized to waive the requirements for construction documents or other supporting data if the *code official* determines they are not necessary to confirm compliance with this code.

C103.2 Information on construction documents. Construction documents shall be drawn to scale on suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, the following as applicable:

1. Energy compliance path.
2. Insulation materials and their *R*-values.
3. Fenestration *U*-factors and solar heat gain coefficients (SHGCs).
4. Area-weighted *U*-factor and solar heat gain coefficient (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water-heating systems and equipment types, sizes and efficiencies.
7. Economizer description.
8. Equipment and system controls.
9. Fan motor horsepower (hp) and controls.
10. Duct sealing, duct and pipe insulation and location.
11. Lighting fixture schedule with wattage and control narrative.
12. Location of *daylight* zones on floor plans.
13. Air barrier and air sealing details, including the location of the air barrier.

C103.2.1 Building thermal envelope depiction. The *building thermal envelope* shall be represented on the construction drawings.

C103.3 Examination of documents. The *code official* shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances. The *code official* is authorized to utilize a registered design professional, or other *approved* entity not affiliated with the building design or construction, in conducting the review of the plans and specifications for compliance with the code.

C103.3.1 Approval of construction documents. When the *code official* issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped "Reviewed for Code Compliance." Such *approved* construction documents shall not be changed, modified or altered without authorization from the *code official*. Work shall be done in accordance with the *approved* construction documents.

One set of construction documents so reviewed shall be retained by the *code official*. The other set shall be returned to the applicant, kept at the site of work and shall be open to inspection by the *code official* or a duly authorized representative.

C103.3.2 Previous approvals. This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

C103.3.3 Phased approval. The *code official* shall have the authority to issue a permit for the construction of part of an energy conservation system before the construction documents for the entire system have been submitted or *approved*, provided that adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holders of such permit shall proceed at their own risk without assurance that the permit for the entire energy conservation system will be granted.

C103.4 Amended construction documents. Changes made during construction that are not in compliance with the *approved* construction documents shall be resubmitted for approval as an amended set of construction documents.

C103.5 Retention of construction documents. One set of *approved* construction documents shall be retained by the *code official* for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

C103.6 Building documentation and closeout submittal requirements. The construction documents shall specify that the documents described in this section be provided to the building owner or owner's authorized agent within 90 days of the date of receipt of the certificate of occupancy.

C103.6.1 Record documents. Construction documents shall be updated to convey a record of the completed work. Such updates shall include mechanical, electrical and control drawings that indicate all changes to size, type and location of components, equipment and assemblies.

C103.6.2 Compliance documentation. Energy code compliance documentation and supporting calculations shall be delivered in one document to the building owner as part of the project record documents or manuals, or as a standalone document. This document shall include the specific energy code edition utilized for compliance determination for each system, documentation demonstrating compliance with Section C303.1.3 for each fenestration product installed, and the interior lighting power compliance path, building area or space-by-space, used to calculate the lighting power allowance.

For projects complying with Item 2 of Section C401.2, the documentation shall include:

1. The envelope insulation compliance path.

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2. All compliance calculations including those required by Sections C402.1.5, C403.8.1, C405.3 and C405.5.

For projects complying with Section C407, the documentation shall include that required by Sections C407.3.1 and C407.3.2.

C103.6.3 Systems operation control. Training shall be provided to those responsible for maintaining and operating equipment included in the manuals required by Section C103.6.2.

The training shall include:

1. Review of manuals and permanent certificate.
2. Hands-on demonstration of all normal maintenance procedures, normal operating modes, and all emergency shutdown and startup procedures.
3. Training completion report.

SECTION C104
FEES

C104.1 Fees. A permit shall not be issued until the fees prescribed in Section C104.2 have been paid, nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

C104.2 Schedule of permit fees. A fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

C104.3 Work commencing before permit issuance. Any person who commences any work before obtaining the necessary permits shall be subject to an additional fee established by the *code official* that shall be in addition to the required permit fees.

C104.4 Related fees. The payment of the fee for the construction, *alteration*, removal or demolition of work done in connection to or concurrently with the work or activity authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

C104.5 Refunds. The *code official* is authorized to establish a refund policy.

SECTION C105
INSPECTIONS

C105.1 General. Construction or work for which a permit is required shall be subject to inspection by the code official, his or her designated agent or an *approved agency*, and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain visible and able to be accessed for inspection purposes. Neither the code official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material, product, system or building component required to allow inspection to validate compliance with this code.

C105.2 Required inspections. The *code official*, his or her designated agent or an *approved agency*, upon notification, shall make the inspections set forth in Sections C105.2.1 through C105.2.6.

C105.2.1 Footing and foundation insulation. Inspections shall verify the footing and foundation insulation *R*-value, location, thickness, depth of burial and protection of insulation as required by the code, *approved* plans and specifications.

C105.2.2 Thermal envelope. Inspections shall verify the correct type of insulation, *R*-values, location of insulation, fenestration, *U*-factor, SHGC and VT, and that air leakage controls are properly installed, as required by the code, *approved* plans and specifications.

C105.2.3 Plumbing system. Inspections shall verify the type of insulation, *R*-values, protection required, controls and heat traps as required by the code, *approved* plans and specifications.

C105.2.4 Mechanical system. Inspections shall verify the installed HVAC equipment for the correct type and size, controls, insulation, *R*-values, system and damper air leakage, minimum fan efficiency, energy recovery and economizer as required by the code, *approved* plans and specifications.

C105.2.5 Electrical system. Inspections shall verify lighting system controls, components and meters as required by the code, *approved* plans and specifications.

C105.2.6 Final inspection. The final inspection shall include verification of the installation and proper operation of all required building controls, and documentation verifying activities associated with required *building commissioning* have been conducted in accordance with Section C408.

C105.3 Reinspection. A building shall be reinspected where determined necessary by the *code official*.

C105.4 Approved inspection agencies. The *code official* is authorized to accept reports of third-party inspection agencies not affiliated with the building design or construction, provided that such agencies are *approved* as to qualifications and reliability relevant to the building components and systems that they are inspecting.

C105.5 Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the *code official* when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

C105.6 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made to achieve compliance

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with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

SECTION C106
NOTICE OF APPROVAL

C106.1 Approval. After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the code *official*.

C106.2 Revocation. The *code official* is authorized to suspend or revoke, in writing, a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the *building* or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION C107
VALIDITY

C107.1 General. If a portion of this code is held to be illegal or void, such a decision shall not affect the validity of the remainder of this code.

SECTION C108
REFERENCED STANDARDS

C108.1 Referenced codes and standards. The codes and standards referenced in this code shall be those listed in Chapter 6, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections C108.1.1 and C108.1.2.

C108.1.1 Conflicts. Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

C108.1.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

C108.2 Applications of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

C108.3 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

SECTION C109
STOP WORK ORDER

C109.1 Authority. Where the *code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the *code official* is authorized to issue a stop work order.

C109.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property, the owner's authorized agent or the person performing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume.

C109.3 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

C109.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fines established by the authority having jurisdiction.

SECTION C110
BOARD OF APPEALS

C110.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The *code official* shall be an ex officio member of said board but shall not have a vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

C110.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall not have authority to waive requirements of this code.

C110.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction.

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CHAPTER 2 [CE]
DEFINITIONS

User note:

About this chapter: *Codes, by their very nature, are technical documents. Every word, term and punctuation mark can add to or change the meaning of a technical requirement. It is necessary to maintain a consensus on the specific meaning of each term contained in the code. Chapter 2 performs this function by stating clearly what specific terms mean for the purposes of the code.*

SECTION C201
GENERAL

C201.1 Scope. Unless stated otherwise, the following words and terms in this code shall have the meanings indicated in this chapter.

C201.2 Interchangeability. Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural includes the singular.

C201.3 Terms defined in other codes. Terms that are not defined in this code but are defined in the *International Building Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *International Plumbing Code* or the *International Residential Code* shall have the meanings ascribed to them in those codes.

C201.4 Terms not defined. Terms not defined by this chapter shall have ordinarily accepted meanings such as the context implies.

SECTION C202
GENERAL DEFINITIONS

ABOVE-GRADE WALL. See "*Wall, above-grade*."

ACCESS (TO). That which enables a device, appliance or equipment to be reached by *ready access* or by a means that first requires the removal or movement of a panel or similar obstruction.

ADDITION. An extension or increase in the *conditioned space* floor area, number of stories or height of a building or structure.

AIR BARRIER. One or more materials joined together in a continuous manner to restrict or prevent the passage of air through the *building thermal envelope* and its assemblies.

AIR CURTAIN. A device, installed at the *building entrance*, that generates and discharges a laminar air stream intended to prevent the infiltration of external, unconditioned air into the conditioned spaces, or the loss of interior, conditioned air to the outside.

ALTERATION. Any construction, retrofit or renovation to an existing structure other than repair or addition. Also, a change in a building, electrical, gas, mechanical or plumbing system that involves an extension, addition or change to the arrangement, type or purpose of the original installation.

APPROVED. Acceptable to the code official.

APPROVED AGENCY. An established and recognized agency that is regularly engaged in conducting tests or furnishing inspection services, or furnishing product certification, where such agency has been approved by the *code official*.

AUTOMATIC. Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current strength, pressure, temperature or mechanical configuration (see "*Manual*").

BELOW-GRADE WALL. See "*Wall, below-grade*."

BIOGAS. A mixture of hydrocarbons that is a gas at 60°F (15.5°C) and 1 atmosphere of pressure that is produced through the anaerobic digestion of organic matter.

BIOMASS. Nonfossilized and biodegradable organic material originating from plants, animals and/or microorganisms, including products, by-products, residues and waste from agriculture, forestry and related industries as well as the nonfossilized and biodegradable organic fractions of industrial and municipal wastes, including gases and liquids recovered from the decomposition of nonfossilized and biodegradable organic material.

BOILER, MODULATING. A boiler that is capable of more than a single firing rate in response to a varying temperature or heating load.

BOILER SYSTEM. One or more boilers, their piping and controls that work together to supply steam or hot water to heat output devices remote from the boiler.

BUBBLE POINT. The refrigerant liquid saturation temperature at a specified pressure.

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy, including any mechanical systems, service water-heating systems and electric power and lighting systems located on the building site and supporting the building.

BUILDING COMMISSIONING. A process that verifies and documents that the selected building systems have been designed, installed and function according to the owner's project requirements and construction documents, and to minimum code requirements.

BUILDING ENTRANCE. Any door, set of doors, doorway or other form of portal that is used to gain access to the building from the outside by the public.

BUILDING SITE. A contiguous area of land that is under the ownership or control of one entity.

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BUILDING THERMAL ENVELOPE. The basement walls, exterior walls, floors, ceilings, roofs and any other building element assemblies that enclose *conditioned space* or provide a boundary between *conditioned space* and exempt or unconditioned space.

CAPTIVE KEY OVERRIDE. A lighting control that will not release the key that activates the override when the lighting is on.

CAVITY INSULATION. Insulating material located between framing members.

***C*-FACTOR (THERMAL CONDUCTANCE).** The coefficient of heat transmission (surface to surface) through a building component or assembly, equal to the time rate of heat flow per unit area and the unit temperature difference between the warm side and cold side surfaces (Btu/h × ft^2 × °F) [W/(m^2 × K)].

CHANGE OF OCCUPANCY. A change in the use of a building or a portion of a building that results in any of the following:

1. A *change of occupancy* classification.
2. A change from one group to another group within an occupancy classification.
3. Any change in use within a group for which there is a change in the application of the requirements of this code.

CIRCULATING HOT WATER SYSTEM. A specifically designed water distribution system where one or more pumps are operated in the service hot water piping to circulate heated water from the water-heating equipment to the fixture supply and back to the water-heating equipment.

CLIMATE ZONE. A geographical region based on climatic criteria as specified in this code.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

COEFFICIENT OF PERFORMANCE (COP) − COOLING. The ratio of the rate of heat removal to the rate of energy input, in consistent units, for a complete refrigerating system or some specific portion of that system under designated operating conditions.

COEFFICIENT OF PERFORMANCE (COP) − HEATING. The ratio of the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system, including the compressor and, if applicable, auxiliary heat, under designated operating conditions.

COMMERCIAL BUILDING. For this code, all buildings that are not included in the definition of "*Residential building*."

COMPUTER ROOM. A room whose primary function is to house equipment for the processing and storage of electronic data which has a design total information technology equipment (ITE) equipment power density less than or equal to 20 watts per square foot (20 watts per 0.092 m^2) of conditioned area or a design total ITE equipment load less than or equal to 10 kW.

CONDENSING UNIT. A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more refrigerant compressors, refrigerant condensers (air-cooled, evaporatively cooled or water-cooled), condenser fans and motors (where used) and factory-supplied accessories.

CONDITIONED FLOOR AREA. The horizontal projection of the floors associated with the *conditioned space*.

CONDITIONED SPACE. An area, room or space that is enclosed within the *building thermal envelope* and is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior or is integral to any opaque surface of the building envelope.

CRAWL SPACE WALL. The opaque portion of a wall that encloses a crawl space and is partially or totally below grade.

CURTAIN WALL. Fenestration products used to create an external nonload-bearing wall that is designed to separate the exterior and interior environments.

DATA CENTER. A room or series of rooms that share data center systems, whose primary function is to house equipment for the processing and storage of electronic data and that has a design total ITE equipment power density exceeding 20 watts per square foot (20 watts per 0.092 m^2) of conditioned area and a total design ITE equipment load greater than 10 kW.

DATA CENTER SYSTEMS. HVAC systems and equipment, or portions thereof, used to provide cooling or ventilation in a data center.

DAYLIGHT RESPONSIVE CONTROL. A device or system that provides automatic control of electric light levels based on the amount of daylight in a space.

DAYLIGHT ZONE. That portion of a building's interior floor area that is illuminated by natural light.

DEMAND CONTROL VENTILATION (DCV). A ventilation system capability that provides for the automatic reduction of outdoor air intake below design rates when the actual occupancy of spaces served by the system is less than design occupancy.

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where one or more pumps prime the service hot water piping with heated water upon a demand for hot water.

DIRECT DIGITAL CONTROL (DDC). A type of control where controlled and monitored analog or binary data, such as temperature and contact closures, are converted to digital format for manipulation and calculations by a digital computer or microprocessor, then converted back to analog or binary form to control physical devices.

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DUCT. A tube or conduit utilized for conveying air. The air passages of self-contained systems are not to be construed as air ducts.

DUCT SYSTEM. A continuous passageway for the transmission of air that, in addition to ducts, includes duct fittings, dampers, plenums, fans and accessory air-handling equipment and appliances.

DWELLING UNIT. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

DYNAMIC GLAZING. Any fenestration product that has the fully reversible ability to change its performance properties, including *U*-factor, solar heat gain coefficient (SHGC) or visible transmittance (VT).

ECONOMIZER, AIR. A duct and damper arrangement and automatic control system that allows a cooling system to supply outside air to reduce or eliminate the need for mechanical cooling during mild or cold weather.

ECONOMIZER, WATER. A system where the supply air of a cooling system is cooled indirectly with water that is itself cooled by heat or mass transfer to the environment without the use of mechanical cooling.

ENCLOSED SPACE. A volume surrounded by solid surfaces such as walls, floors, roofs and openable devices, such as doors and operable windows.

ENERGY ANALYSIS. A method for estimating the annual energy use of the *proposed design* and *standard reference design* based on estimates of energy use.

ENERGY COST. The total estimated annual cost for purchased energy for the building functions regulated by this code, including applicable demand charges.

ENERGY RECOVERY VENTILATION SYSTEM. Systems that employ air-to-air heat exchangers to recover energy from exhaust air for the purpose of preheating, precooling, humidifying or dehumidifying outdoor ventilation air prior to supplying the air to a space, either directly or as part of an HVAC system.

ENERGY SIMULATION TOOL. An *approved* software program or calculation-based methodology that projects the annual energy use of a building.

ENTHALPY RECOVERY RATIO. Change in the enthalpy of the *outdoor air* supply divided by the difference between the *outdoor air* and entering exhaust air enthalpy, expressed as a percentage.

ENTRANCE DOOR. A vertical fenestration product used for occupant ingress, egress and access in nonresidential buildings, including, but not limited to, exterior entrances utilizing latching hardware and automatic closers and containing over 50 percent glazing specifically designed to withstand heavy-duty usage.

EQUIPMENT ROOM. A space that contains either electrical equipment, mechanical equipment, machinery, water pumps or hydraulic pumps that are a function of the building's services.

EXTERIOR WALL. Walls including both above-grade walls and basement walls.

FAN, EMBEDDED. A fan that is part of a manufactured assembly where the assembly includes functions other than air movement.

FAN ARRAY. Multiple fans in parallel between two plenum sections in an air distribution system.

FAN BRAKE HORSEPOWER (BHP). The horsepower delivered to the fan's shaft. Brake horsepower does not include the mechanical drive losses, such as that from belts and gears.

FAN ENERGY INDEX (FEI). The ratio of the electric input power of a reference fan to the electric input power of the actual fan as calculated in accordance with AMCA 208.

FAN NAMEPLATE ELECTRICAL INPUT POWER. The nominal electrical input power rating stamped on a fan assembly nameplate.

FAN SYSTEM BHP. The sum of the fan brake horsepower of all fans that are required to operate at fan system design conditions to supply air from the heating or cooling source to the *conditioned spaces* and return it to the source or exhaust it to the outdoors.

FAN SYSTEM DESIGN CONDITIONS. Operating conditions that can be expected to occur during normal system operation that result in the highest supply fan airflow rate to conditioned spaces served by the system, other than during air economizer operation.

FAN SYSTEM ELECTRICAL INPUT POWER. The sum of the fan electrical power of all fans that are required to operate at fan system design conditions to supply air from the heating or cooling source to the conditioned spaces and/or return it to the source or exhaust it to the outdoors.

FAN SYSTEM MOTOR NAMEPLATE HP. The sum of the motor nameplate horsepower of all fans that are required to operate at design conditions to supply air from the heating or cooling source to the *conditioned spaces* and return it to the source or exhaust it to the outdoors.

FAULT DETECTION AND DIAGNOSTICS (FDD) SYSTEM. A software platform that utilizes building analytic algorithms to convert data provided by sensors and devices to automatically identify faults in building systems and provide a prioritized list of actionable resolutions to those faults based on cost or energy avoidance, comfort and maintenance impact.

FENESTRATION. Products classified as either skylights or vertical fenestration.

Skylights. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal, including unit skylights, tubular daylighting devices and glazing materials in solariums, sunrooms, roofs, greenhouses and sloped walls.

Vertical fenestration. Windows that are fixed or operable, opaque doors, glazed doors, glazed block and combination opaque and glazed doors composed of glass

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or other transparent or translucent glazing materials and installed at a slope of not less than 60 degrees (1.05 rad) from horizontal.

FENESTRATION PRODUCT, FIELD-FABRICATED. A fenestration product whose frame is made at the construction site of standard dimensional lumber or other materials that were not previously cut or otherwise formed with the specific intention of being used to fabricate a fenestration product or exterior door. Field-fabricated does not include site-built fenestration.

FENESTRATION PRODUCT, SITE-BUILT. A fenestration designed to be made up of field-glazed or field-assembled units using specific factory cut or otherwise factory-formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls and atrium roof systems.

***F*-FACTOR.** The perimeter heat loss factor for slab-on-grade floors (Btu/h × ft × °F) [W/(m × K)].

FLOOR AREA, NET. The actual occupied area not including unoccupied accessory areas such as corridors, stairways, toilet rooms, mechanical rooms and closets.

GENERAL LIGHTING. Interior lighting that provides a substantially uniform level of illumination throughout a space.

GREENHOUSE. A structure or a thermally isolated area of a building that maintains a specialized sunlit environment exclusively used for, and essential to, the cultivation, protection or maintenance of plants. *Greenhouses* are those that are erected for a period of 180 days or more.

GROUP R. Buildings or portions of buildings that contain any of the following occupancies as established in the *International Building Code*:

1. *Group R*-1.
2. *Group R*-2 where located more than three stories in height above grade plane.
3. *Group R*-4 where located more than three stories in height above grade plane.

HEAT TRAP. An arrangement of piping and fittings, such as elbows, or a commercially available heat trap that prevents thermosyphoning of hot water during standby periods.

HEATED SLAB. Slab-on-grade construction in which the heating elements, hydronic tubing or hot air distribution system is in contact with, or placed within or under, the slab.

HIGH SPEED DOOR. A nonswinging door used primarily to facilitate vehicular access or material transportation, with a minimum opening rate of 32 inches (813 mm) per second, a minimum closing rate of 24 inches (610 mm) per second and that includes an automatic-closing device.

HISTORIC BUILDING. Any building or structure that is one or more of the following:

1. Listed, or certified as eligible for listing, by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.
2. Designated as historic under an applicable state or local law.
3. Certified as a contributing resource within a National Register-listed, state-designated or locally designated historic district.

IEC DESIGN H MOTOR. An electric motor that meets all of the following:

1. It is an induction motor designed for use with three-phase power.
2. It contains a cage rotor.
3. It is capable of direct-on-line starting.
4. It has four, six or eight poles.
5. It is rated from 0.4 kW to 1600 kW at a frequency of 60 hertz.

IEC DESIGN N MOTOR. An electric motor that meets all of the following:

1. It is an induction motor designed for use with three-phase power.
2. It contains a cage rotor.
3. It is capable of direct-on-line starting.
4. It has two, four, six or eight poles.
5. It is rated from 0.4 kW to 1600 kW at a frequency of 60 hertz.

INFILTRATION. The uncontrolled inward air leakage into a building caused by the pressure effects of wind or the effect of differences in the indoor and outdoor air density or both.

INFORMATION TECHNOLOGY EQUIPMENT (ITE). Items including computers, data storage devices, servers and network and communication equipment.

INTEGRATED PART LOAD VALUE (IPLV). A single-number figure of merit based on part-load EER, COP or kW/ton expressing part-load efficiency for air-conditioning and heat pump equipment on the basis of weighted operation at various load capacities for equipment.

INTERNAL CURTAIN SYSTEM. A system consisting of movable panels of fabric or plastic film used to cover and uncover the space enclosed in a *greenhouse* on a daily basis.

ISOLATION DEVICES. Devices that isolate HVAC zones so that they can be operated independently of one another. *Isolation devices* include separate systems, isolation dampers and controls providing shutoff at terminal boxes.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, *approved agency* or other organization concerned with product evaluation that maintains periodic inspection of the production of the labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LARGE-DIAMETER CEILING FAN. A ceiling fan that is greater than 7 feet (2134 mm) in diameter. These fans are sometimes referred to as High-Volume, Low-Speed (HVLS) fans.

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LINER SYSTEM (Ls). A system that includes the following:

1. A continuous vapor barrier liner membrane that is installed below the purlins and that is uninterrupted by framing members.
2. An uncompressed, unfaced insulation resting on top of the liner membrane and located between the purlins.

For multilayer installations, the last rated *R*-value of insulation is for unfaced insulation draped over purlins and then compressed when the metal roof panels are attached.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the *code official* and concerned with evaluation of products or services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

LOW-SLOPED ROOF. A roof having a slope less than 2 units vertical in 12 units horizontal.

LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMER. A transformer that is air-cooled, does not use oil as a coolant, has an input voltage less than or equal to 600 volts and is rated for operation at a frequency of 60 hertz.

LUMINAIRE-LEVEL LIGHTING CONTROLS. A lighting system consisting of one or more luminaires with embedded lighting control logic, occupancy and ambient light sensors, wireless networking capabilities and local override switching capability, where required.

MANUAL. Capable of being operated by personal intervention (see "*Automatic*").

NAMEPLATE HORSEPOWER. The nominal motor output power rating stamped on the motor nameplate.

NEMA DESIGN A MOTOR. A squirrel-cage motor that meets all of the following:

1. It is designed to withstand full-voltage starting and develop locked-rotor torque as shown in paragraph 12.38.1 of NEMA MG 1.
2. It has pull-up torque not less than the values shown in paragraph 12.40.1 of NEMA MG 1.
3. It has breakdown torque not less than the values shown in paragraph 12.39.1 of NEMA MG 1.
4. It has a locked-rotor current higher than the values shown in paragraph 12.35.1 of NEMA MG 1 for 60 hertz and paragraph 12.35.2 of NEMA MG 1 for 50 hertz.
5. It has a slip at rated load of less than 5 percent for motors with fewer than 10 poles.

NEMA DESIGN B MOTOR. A squirrel-cage motor that meets all of the following:

1. It is designed to withstand full-voltage starting.
2. It develops locked-rotor, breakdown and pull-up torques adequate for general application as specified in Sections 12.38, 12.39 and 12.40 of NEMA MG1.
3. It draws locked-rotor current not to exceed the values shown in Section 12.35.1 for 60 hertz and Section 12.35.2 for 50 hertz of NEMA MG1.
4. It has a slip at rated load of less than 5 percent for motors with fewer than 10 poles.

NEMA DESIGN C MOTOR. A squirrel-cage motor that meets all of the following:

1. Designed to withstand full-voltage starting and develop locked-rotor torque for high-torque applications up to the values shown in paragraph 12.38.2 of NEMA MG1 (incorporated by reference, see A§431.15).
2. It has pull-up torque not less than the values shown in paragraph 12.40.2 of NEMA MG1.
3. It has breakdown torque not less than the values shown in paragraph 12.39.2 of NEMA MG1.
4. It has a locked-rotor current not to exceed the values shown in paragraph 12.35.1 of NEMA MG1 for 60 hertz and paragraph 12.35.2 for 50 hertz.
5. It has a slip at rated load of less than 5 percent.

NETWORKED GUESTROOM CONTROL SYSTEM. A control system, with access from the front desk or other central location associated with a *Group R*-1 building, that is capable of identifying the rented and unrented status of each guestroom according to a timed schedule, and is capable of controlling HVAC in each hotel and motel guestroom separately.

NONSTANDARD PART LOAD VALUE (NPLV). A single-number part-load efficiency figure of merit calculated and referenced to conditions other than IPLV conditions, for units that are not designed to operate at AHRI standard rating conditions.

OCCUPANT SENSOR CONTROL. An automatic control device or system that detects the presence or absence of people within an area and causes lighting, equipment or appliances to be regulated accordingly.

ON-SITE RENEWABLE ENERGY. Energy from renewable energy resources harvested at the building project site.

OPAQUE DOOR. A door that is not less than 50-percent opaque in surface area.

POWERED ROOF/WALL VENTILATORS. A fan consisting of a centrifugal or axial impeller with an integral driver in a weather-resistant housing and with a base designed to fit, usually by means of a curb, over a wall or roof opening.

PROPOSED DESIGN. A description of the proposed building used to estimate annual energy use for determining compliance based on total building performance.

RADIANT HEATING SYSTEM. A heating system that transfers heat to objects and surfaces within a conditioned space, primarily by infrared radiation.

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READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached without requiring the removal or movement of any panel or similar obstruction.

REFRIGERANT DEW POINT. The refrigerant vapor saturation temperature at a specified pressure.

REFRIGERATED WAREHOUSE COOLER. An enclosed storage space capable of being refrigerated to temperatures above 32°F (0°C) that can be walked into and has a total chilled storage area of not less than 3,000 square feet (279 m^2).

REFRIGERATED WAREHOUSE FREEZER. An enclosed storage space capable of being refrigerated to temperatures at or below 32°F (0°C) that can be walked into and has a total chilled storage area of not less than 3,000 square feet (279 m^2).

REFRIGERATION SYSTEM, LOW TEMPERATURE. Systems for maintaining food product in a frozen state in refrigeration applications.

REFRIGERATION SYSTEM, MEDIUM TEMPERATURE. Systems for maintaining food product above freezing in refrigeration applications.

REGISTERED DESIGN PROFESSIONAL. An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

RENEWABLE ENERGY RESOURCES. Energy derived from solar radiation, wind, waves, tides, landfill gas, biogas, biomass or extracted from hot fluid or steam heated within the earth.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage.

REROOFING. The process of recovering or replacing an existing roof covering. See "*Roof recover*" and "*Roof replacement*."

RESIDENTIAL BUILDING. For this code, includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) and *Group R*-2, R-3 and R-4 buildings three stories or less in height above grade plane.

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly includes the roof covering, underlayment, roof deck, insulation, vapor retarder and interior finish.

ROOF RECOVER. The process of installing an additional roof covering over an existing roof covering without removing the existing roof covering.

ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purpose of its maintenance.

ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

ROOFTOP MONITOR. A raised section of a roof containing vertical fenestration along one or more sides.

***R*-VALUE (THERMAL RESISTANCE).** The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area (h × ft^2 × °F/Btu) [(m^2 × K)/W].

SATURATED CONDENSING TEMPERATURE. The saturation temperature corresponding to the measured refrigerant pressure at the condenser inlet for single component and azeotropic refrigerants, and the arithmetic average of the dew point and *bubble point* temperatures corresponding to the refrigerant pressure at the condenser entrance for zeotropic refrigerants.

SERVICE WATER HEATING. Supply of hot water for purposes other than comfort heating.

SLEEPING UNIT. A room or space in which people sleep that can include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are part of a dwelling unit are not *sleeping units*.

SMALL ELECTRIC MOTOR. A general purpose alternating-current single-speed induction motor.

SOLAR HEAT GAIN COEFFICIENT (SHGC). The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation that is then reradiated, conducted or convected into the space.

STANDARD REFERENCE DESIGN. A version of the *proposed design* that meets the minimum requirements of this code and is used to determine the maximum annual energy use requirement for compliance based on total building performance.

STOREFRONT. A system of doors and windows mulled as a composite fenestration structure that has been designed to resist heavy use. *Storefront* systems include, but are not limited to, exterior fenestration systems that span from the floor level or above to the ceiling of the same story on commercial buildings, with or without mulled windows and doors.

TESTING UNIT ENCLOSURE AREA. The area sum of all the boundary surfaces that define the *dwelling unit*, *sleeping unit* or occupiable *conditioned space* including top/ceiling, bottom/floor and all side walls. This does not include interior partition walls within the *dwelling unit*, *sleeping unit*, or occupiable *conditioned space*. Wall height shall be measured from the finished floor of the *conditioned space* to the finished floor or roof/ceiling air barrier above.

THERMAL DISTRIBUTION EFFICIENCY (TDE). The resistance to changes in air heat as air is conveyed through a distance of air duct. TDE is a heat loss calculation evaluating the difference in the heat of the air between the air duct inlet and outlet caused by differences in temperatures between the air in the duct and the duct material. TDE is expressed as a percent difference between the inlet and outlet heat in the duct.

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THERMOSTAT. An automatic control device used to maintain temperature at a fixed or adjustable setpoint.

TIME SWITCH CONTROL. An automatic control device or system that controls lighting or other loads, including switching off, based on time schedules.

***U*-FACTOR (THERMAL TRANSMITTANCE).** The coefficient of heat transmission (air to air) through a building component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films (Btu/h × ft^2 × °F) [W/(m^2 × K)].

VARIABLE REFRIGERANT FLOW SYSTEM. An engineered direct-expansion (DX) refrigerant system that incorporates a common condensing unit, at least one variable-capacity compressor, a distributed refrigerant piping network to multiple indoor fan heating and cooling units each capable of individual zone temperature control, through integral zone temperature control devices and a common communications network. Variable refrigerant flow utilizes three or more steps of control on common interconnecting piping.

VEGETATIVE ROOF. An assembly of interacting components designed to waterproof a building's top surface that includes, by design, vegetation and related landscape elements.

VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

VENTILATION AIR. That portion of supply air that comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

VISIBLE TRANSMITTANCE (VT). The ratio of visible light entering the space through the fenestration product assembly to the incident visible light. Visible transmittance includes the effects of glazing material and frame and is expressed as a number between 0 and 1.

VISIBLE TRANSMITTANCE, ANNUAL (VT_{annual}). The ratio of visible light entering the space through the fenestration product assembly to the incident visible light during the course of a year, which includes the effects of glazing material, frame, and light well or tubular conduit, and is expressed as a number between 0 and 1.

VOLTAGE DROP. A decrease in voltage caused by losses in the wiring systems that connect the power source to the load.

WALK-IN COOLER. An enclosed storage space capable of being refrigerated to temperatures above 32°F (0°C) and less than 55°F (12.8°C) that can be walked into, has a ceiling height of not less than 7 feet (2134 mm) and has a total chilled storage area of less than 3,000 square feet (279 m^2).

WALK-IN FREEZER. An enclosed storage space capable of being refrigerated to temperatures at or below 32°F (0°C) that can be walked into, has a ceiling height of not less than 7 feet (2134 mm) and has a total chilled storage area of less than 3,000 square feet (279 m^2).

WALL, ABOVE-GRADE. A wall associated with the *building thermal envelope* that is more than 15 percent above grade and is on the exterior of the building or any wall that is associated with the *building thermal envelope* that is not on the exterior of the building. This includes, but is not limited to, between-floor spandrels, peripheral edges of floors, roof knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and skylight shafts.

WALL, BELOW-GRADE. A wall associated with the basement or first story of the building that is part of the *building thermal envelope*, is not less than 85 percent below grade and is on the exterior of the building.

WATER HEATER. Any heating appliance or equipment that heats potable water and supplies such water to the potable hot water distribution system.

ZONE. A space or group of spaces within a building with heating or cooling requirements that are sufficiently similar so that desired conditions can be maintained throughout using a single controlling device.

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CHAPTER 3 [CE]
GENERAL REQUIREMENTS

User note:

About this chapter: *Chapter 3 addresses broadly applicable requirements that would not be at home in other chapters having more specific coverage of subject matter. This chapter establishes climate zone by US counties and territories and includes methodology for determining climate zones elsewhere. It also contains product rating, marking and installation requirements for materials such as insulation, windows, doors and siding.*

SECTION C301
CLIMATE ZONES

C301.1 General. *Climate zones* from Figure C301.1 or Table C301.1 shall be used for determining the applicable requirements from Chapter 4. Locations not indicated in Table C301.1 shall be assigned a *climate zone* in accordance with Section C301.3.

C301.2 Warm Humid counties. In Table C301.1, Warm Humid counties are identified by an asterisk.

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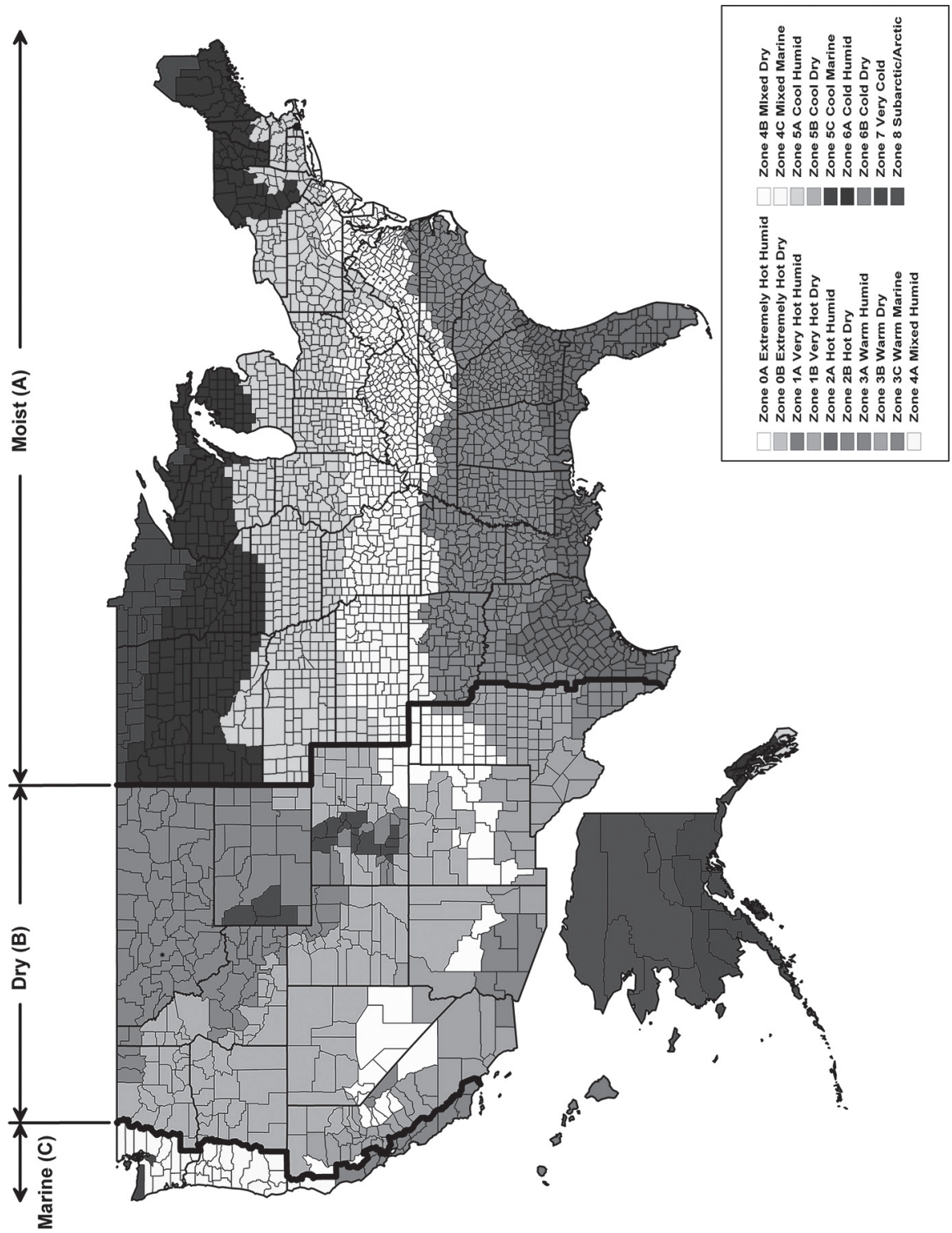


FIGURE C301.1
CLIMATE ZONES

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TABLE C301.1
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES
ALABAMA
3A Autauga*
2A Baldwin*
3A Barbour*
3A Bibb
3A Blount
3A Bullock*
3A Butler*
3A Calhoun
3A Chambers
3A Cherokee
3A Chilton
3A Choctaw*
3A Clarke*
3A Clay
3A Cleburne
2A Coffee*
3A Colbert
3A Conecuh*
3A Coosa
2A Covington*
3A Crenshaw*
3A Cullman
2A Dale*
3A Dallas*
3A DeKalb
3A Elmore*
2A Escambia*
3A Etowah
3A Fayette
3A Franklin
2A Geneva*
3A Greene
3A Hale
2A Henry*
2A Houston*
3A Jackson
3A Jefferson
3A Lamar
3A Lauderdale
3A Lawrence
3A Lee
3A Limestone
3A Lowndes*
3A Macon*
3A Madison
3A Marengo*
3A Marion
3A Marshall
2A Mobile*
3A Monroe*
3A Montgomery*
3A Morgan
3A Perry*
3A Pickens
3A Pike*
3A Randolph
3A Russell*
3A Shelby
3A St. Clair
3A Sumter
3A Talladega
3A Tallapoosa
3A Tuscaloosa
3A Walker
3A Washington*
3A Wilcox*
3A Winston
ALASKA
7 Aleutians East
7 Aleutians West
7 Anchorage
7 Bethel
7 Bristol Bay
8 Denali
7 Dillingham
8 Fairbanks North Star
6A Haines
6A Juneau
7 Kenai Peninsula
5C Ketchikan Gateway
6A Kodiak Island
7 Lake and Peninsula
7 Matanuska-Susitna
8 Nome
8 North Slope
8 Northwest Arctic

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ALASKA *(continued)*
5C Prince of Wales Outer Ketchikan
5C Sitka
6A Skagway-Hoonah-Angoon
8 Southeast Fairbanks
7 Valdez-Cordova
8 Wade Hampton
6A Wrangell-Petersburg
7 Yakutat
8 Yukon-Koyukuk
ARIZONA
5B Apache
3B Cochise
5B Coconino
4B Gila
3B Graham
3B Greenlee
2B La Paz
2B Maricopa
3B Mohave
5B Navajo
2B Pima
2B Pinal
3B Santa Cruz
4B Yavapai
2B Yuma
ARKANSAS
3A Arkansas
3A Ashley
4A Baxter
4A Benton
4A Boone
3A Bradley
3A Calhoun
4A Carroll
3A Chicot
3A Clark
3A Clay
3A Cleburne
3A Cleveland
3A Columbia*
3A Conway
3A Craighead
3A Crawford
3A Crittenden
3A Cross
3A Dallas
3A Desha
3A Drew
3A Faulkner
3A Franklin
4A Fulton
3A Garland
3A Grant
3A Greene
3A Hempstead*
3A Hot Spring
3A Howard
3A Independence
4A Izard
3A Jackson
3A Jefferson
3A Johnson
3A Lafayette*
3A Lawrence
3A Lee
3A Lincoln
3A Little River*
3A Logan
3A Lonoke
4A Madison
4A Marion
3A Miller*
3A Mississippi
3A Monroe
3A Montgomery
3A Nevada
4A Newton
3A Ouachita
3A Perry
3A Phillips
3A Pike
3A Poinsett
3A Polk
3A Pope
3A Prairie
3A Pulaski
3A Randolph

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ARKANSAS *(continued)*
3A Saline
3A Scott
4A Searcy
3A Sebastian
3A Sevier*
3A Sharp
3A St. Francis
4A Stone
3A Union*
3A Van Buren
4A Washington
3A White
3A Woodruff
3A Yell
CALIFORNIA
3C Alameda
6B Alpine
4B Amador
3B Butte
4B Calaveras
3B Colusa
3B Contra Costa
4C Del Norte
4B El Dorado
3B Fresno
3B Glenn
4C Humboldt
2B Imperial
4B Inyo
3B Kern
3B Kings
4B Lake
5B Lassen
3B Los Angeles
3B Madera
3C Marin
4B Mariposa
3C Mendocino
3B Merced
5B Modoc
6B Mono
3C Monterey
3C Napa
5B Nevada
3B Orange
3B Placer
5B Plumas
3B Riverside
3B Sacramento
3C San Benito
3B San Bernardino
3B San Diego
3C San Francisco
3B San Joaquin
3C San Luis Obispo
3C San Mateo
3C Santa Barbara
3C Santa Clara
3C Santa Cruz
3B Shasta
5B Sierra
5B Siskiyou
3B Solano
3C Sonoma
3B Stanislaus
3B Sutter
3B Tehama
4B Trinity
3B Tulare
4B Tuolumne
3C Ventura
3B Yolo
3B Yuba
COLORADO
5B Adams
6B Alamosa
5B Arapahoe
6B Archuleta
4B Baca
4B Bent
5B Boulder
5B Broomfield
6B Chaffee
5B Cheyenne
7 Clear Creek
6B Conejos
6B Costilla
5B Crowley

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
COLORADO *(continued)*
5B Custer
5B Delta
5B Denver
6B Dolores
5B Douglas
6B Eagle
5B Elbert
5B El Paso
5B Fremont
5B Garfield
5B Gilpin
7 Grand
7 Gunnison
7 Hinsdale
5B Huerfano
7 Jackson
5B Jefferson
5B Kiowa
5B Kit Carson
7 Lake
5B La Plata
5B Larimer
4B Las Animas
5B Lincoln
5B Logan
5B Mesa
7 Mineral
6B Moffat
5B Montezuma
5B Montrose
5B Morgan
4B Otero
6B Ouray
7 Park
5B Phillips
7 Pitkin
4B Prowers
5B Pueblo
6B Rio Blanco
7 Rio Grande
7 Routt
6B Saguache
7 San Juan
6B San Miguel
5B Sedgwick
7 Summit
5B Teller
5B Washington
5B Weld
5B Yuma
CONNECTICUT
5A (all)
DELAWARE
4A (all)
DISTRICT OF COLUMBIA
4A (all)
FLORIDA
2A Alachua*
2A Baker*
2A Bay*
2A Bradford*
2A Brevard*
1A Broward*
2A Calhoun*
2A Charlotte*
2A Citrus*
2A Clay*
2A Collier*
2A Columbia*
2A DeSoto*
2A Dixie*
2A Duval*
2A Escambia*
2A Flagler*
2A Franklin*
2A Gadsden*
2A Gilchrist*
2A Glades*
2A Gulf*
2A Hamilton*
2A Hardee*
2A Hendry*
2A Hernando*
2A Highlands*
2A Hillsborough*
2A Holmes*
2A Indian River*
2A Jackson*

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
FLORIDA *(continued)*
2A Jefferson*
2A Lafayette*
2A Lake*
2A Lee*
2A Leon*
2A Levy*
2A Liberty*
2A Madison*
2A Manatee*
2A Marion*
2A Martin*
1A Miami-Dade*
1A Monroe*
2A Nassau*
2A Okaloosa*
2A Okeechobee*
2A Orange*
2A Osceola*
1A Palm Beach*
2A Pasco*
2A Pinellas*
2A Polk*
2A Putnam*
2A Santa Rosa*
2A Sarasota*
2A Seminole*
2A St. Johns*
2A St. Lucie*
2A Sumter*
2A Suwannee*
2A Taylor*
2A Union*
2A Volusia*
2A Wakulla*
2A Walton*
2A Washington*
GEORGIA
2A Appling*
2A Atkinson*
2A Bacon*
2A Baker*
3A Baldwin
3A Banks
3A Barrow
3A Bartow
3A Ben Hill*
2A Berrien*
3A Bibb
3A Bleckley*
2A Brantley*
2A Brooks*
2A Bryan*
3A Bulloch*
3A Burke
3A Butts
2A Calhoun*
2A Camden*
3A Candler*
3A Carroll
3A Catoosa
2A Charlton*
2A Chatham*
3A Chattahoochee*
3A Chattooga
3A Cherokee
3A Clarke
3A Clay*
3A Clayton
2A Clinch*
3A Cobb
2A Coffee*
2A Colquitt*
3A Columbia
2A Cook*
3A Coweta
3A Crawford
3A Crisp*
3A Dade
3A Dawson
2A Decatur*
3A DeKalb
3A Dodge*
3A Dooly*
2A Dougherty*
3A Douglas
2A Early*
2A Echols*
2A Effingham*

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
GEORGIA *(continued)*
3A Elbert
3A Emanuel*
2A Evans*
3A Fannin
3A Fayette
3A Floyd
3A Forsyth
3A Franklin
3A Fulton
3A Gilmer
3A Glascock
2A Glynn*
3A Gordon
2A Grady*
3A Greene
3A Gwinnett
3A Habersham
3A Hall
3A Hancock
3A Haralson
3A Harris
3A Hart
3A Heard
3A Henry
3A Houston*
3A Irwin*
3A Jackson
3A Jasper
2A Jeff Davis*
3A Jefferson
3A Jenkins*
3A Johnson*
3A Jones
3A Lamar
2A Lanier*
3A Laurens*
3A Lee*
2A Liberty*
3A Lincoln
2A Long*
2A Lowndes*
3A Lumpkin
3A Macon*
3A Madison
3A Marion*
3A McDuffie
2A McIntosh*
3A Meriwether
2A Miller*
2A Mitchell*
3A Monroe
3A Montgomery*
3A Morgan
3A Murray
3A Muscogee
3A Newton
3A Oconee
3A Oglethorpe
3A Paulding
3A Peach*
3A Pickens
2A Pierce*
3A Pike
3A Polk
3A Pulaski*
3A Putnam
3A Quitman*
3A Rabun
3A Randolph*
3A Richmond
3A Rockdale
3A Schley*
3A Screven*
2A Seminole*
3A Spalding
3A Stephens
3A Stewart*
3A Sumter*
3A Talbot
3A Taliaferro
2A Tattnall*
3A Taylor*
3A Telfair*
3A Terrell*
2A Thomas*
2A Tift*
2A Toombs*
3A Towns

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
GEORGIA *(continued)*
3A Treutlen*
3A Troup
3A Turner*
3A Twiggs*
3A Union
3A Upson
3A Walker
3A Walton
2A Ware*
3A Warren
3A Washington
2A Wayne*
3A Webster*
3A Wheeler*
3A White
3A Whitfield
3A Wilcox*
3A Wilkes
3A Wilkinson
2A Worth*
HAWAII
1A (all)*
IDAHO
5B Ada
6B Adams
6B Bannock
6B Bear Lake
5B Benewah
6B Bingham
6B Blaine
6B Boise
6B Bonner
6B Bonneville
6B Boundary
6B Butte
6B Camas
5B Canyon
6B Caribou
5B Cassia
6B Clark
5B Clearwater
6B Custer
5B Elmore
6B Franklin
6B Fremont
5B Gem
5B Gooding
5B Idaho
6B Jefferson
5B Jerome
5B Kootenai
5B Latah
6B Lemhi
5B Lewis
5B Lincoln
6B Madison
5B Minidoka
5B Nez Perce
6B Oneida
5B Owyhee
5B Payette
5B Power
5B Shoshone
6B Teton
5B Twin Falls
6B Valley
5B Washington
ILLINOIS
5A Adams
4A Alexander
4A Bond
5A Boone
5A Brown
5A Bureau
4A Calhoun
5A Carroll
5A Cass
5A Champaign
4A Christian
4A Clark
4A Clay
4A Clinton
4A Coles
5A Cook
4A Crawford
4A Cumberland
5A DeKalb
5A De Witt

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ILLINOIS *(continued)*
5A Douglas
5A DuPage
5A Edgar
4A Edwards
4A Effingham
4A Fayette
5A Ford
4A Franklin
5A Fulton
4A Gallatin
4A Greene
5A Grundy
4A Hamilton
5A Hancock
4A Hardin
5A Henderson
5A Henry
5A Iroquois
4A Jackson
4A Jasper
4A Jefferson
4A Jersey
5A Jo Daviess
4A Johnson
5A Kane
5A Kankakee
5A Kendall
5A Knox
5A Lake
5A La Salle
4A Lawrence
5A Lee
5A Livingston
5A Logan
5A Macon
4A Macoupin
4A Madison
4A Marion
5A Marshall
5A Mason
4A Massac
5A McDonough
5A McHenry
5A McLean
5A Menard
5A Mercer
4A Monroe
4A Montgomery
5A Morgan
5A Moultrie
5A Ogle
5A Peoria
4A Perry
5A Piatt
5A Pike
4A Pope
4A Pulaski
5A Putnam
4A Randolph
4A Richland
5A Rock Island
4A Saline
5A Sangamon
5A Schuyler
5A Scott
4A Shelby
5A Stark
4A St. Clair
5A Stephenson
5A Tazewell
4A Union
5A Vermilion
4A Wabash
5A Warren
4A Washington
4A Wayne
4A White
5A Whiteside
5A Will
4A Williamson
5A Winnebago
5A Woodford
INDIANA
5A Adams
5A Allen
4A Bartholomew
5A Benton
5A Blackford
5A Boone
4A Brown

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
INDIANA *(continued)*
5A Carroll
5A Cass
4A Clark
4A Clay
5A Clinton
4A Crawford
4A Daviess
4A Dearborn
4A Decatur
5A De Kalb
5A Delaware
4A Dubois
5A Elkhart
4A Fayette
4A Floyd
5A Fountain
4A Franklin
5A Fulton
4A Gibson
5A Grant
4A Greene
5A Hamilton
5A Hancock
4A Harrison
4A Hendricks
5A Henry
5A Howard
5A Huntington
4A Jackson
5A Jasper
5A Jay
4A Jefferson
4A Jennings
4A Johnson
4A Knox
5A Kosciusko
5A LaGrange
5A Lake
5A LaPorte
4A Lawrence
5A Madison
4A Marion
5A Marshall
4A Martin
5A Miami
4A Monroe
5A Montgomery
4A Morgan
5A Newton
5A Noble
4A Ohio
4A Orange
4A Owen
5A Parke
4A Perry
4A Pike
5A Porter
4A Posey
5A Pulaski
4A Putnam
5A Randolph
4A Ripley
4A Rush
4A Scott
4A Shelby
4A Spencer
5A Starke
5A Steuben
5A St. Joseph
4A Sullivan
4A Switzerland
5A Tippecanoe
5A Tipton
4A Union
4A Vanderburgh
5A Vermillion
4A Vigo
5A Wabash
5A Warren
4A Warrick
4A Washington
5A Wayne
5A Wells
5A White
5A Whitley
IOWA
5A Adair
5A Adams

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
IOWA *(continued)*
5A Allamakee
5A Appanoose
5A Audubon
5A Benton
6A Black Hawk
5A Boone
5A Bremer
5A Buchanan
5A Buena Vista
5A Butler
5A Calhoun
5A Carroll
5A Cass
5A Cedar
6A Cerro Gordo
5A Cherokee
5A Chickasaw
5A Clarke
6A Clay
5A Clayton
5A Clinton
5A Crawford
5A Dallas
5A Davis
5A Decatur
5A Delaware
5A Des Moines
6A Dickinson
5A Dubuque
6A Emmet
5A Fayette
5A Floyd
5A Franklin
5A Fremont
5A Greene
5A Grundy
5A Guthrie
5A Hamilton
6A Hancock
5A Hardin
5A Harrison
5A Henry
5A Howard
5A Humboldt
5A Ida
5A Iowa
5A Jackson
5A Jasper
5A Jefferson
5A Johnson
5A Jones
5A Keokuk
6A Kossuth
5A Lee
5A Linn
5A Louisa
5A Lucas
6A Lyon
5A Madison
5A Mahaska
5A Marion
5A Marshall
5A Mills
6A Mitchell
5A Monona
5A Monroe
5A Montgomery
5A Muscatine
6A O'Brien
6A Osceola
5A Page
6A Palo Alto
5A Plymouth
5A Pocahontas
5A Polk
5A Pottawattamie
5A Poweshiek
5A Ringgold
5A Sac
5A Scott
5A Shelby
6A Sioux
5A Story
5A Tama
5A Taylor
5A Union
5A Van Buren
5A Wapello

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
IOWA *(continued)*
5A Warren
5A Washington
5A Wayne
5A Webster
6A Winnebago
5A Winneshiek
5A Woodbury
6A Worth
5A Wright
KANSAS
4A Allen
4A Anderson
4A Atchison
4A Barber
4A Barton
4A Bourbon
4A Brown
4A Butler
4A Chase
4A Chautauqua
4A Cherokee
5A Cheyenne
4A Clark
4A Clay
4A Cloud
4A Coffey
4A Comanche
4A Cowley
4A Crawford
5A Decatur
4A Dickinson
4A Doniphan
4A Douglas
4A Edwards
4A Elk
4A Ellis
4A Ellsworth
4A Finney
4A Ford
4A Franklin
4A Geary
5A Gove
4A Graham
4A Grant
4A Gray
5A Greeley
4A Greenwood
4A Hamilton
4A Harper
4A Harvey
4A Haskell
4A Hodgeman
4A Jackson
4A Jefferson
5A Jewell
4A Johnson
4A Kearny
4A Kingman
4A Kiowa
4A Labette
4A Lane
4A Leavenworth
4A Lincoln
4A Linn
5A Logan
4A Lyon
4A Marion
4A Marshall
4A McPherson
4A Meade
4A Miami
4A Mitchell
4A Montgomery
4A Morris
4A Morton
4A Nemaha
4A Neosho
4A Ness
5A Norton
4A Osage
4A Osborne
4A Ottawa
4A Pawnee
5A Phillips
4A Pottawatomie
4A Pratt
5A Rawlins
4A Reno

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
KANSAS *(continued)*
5A Republic
4A Rice
4A Riley
4A Rooks
4A Rush
4A Russell
4A Saline
5A Scott
4A Sedgwick
4A Seward
4A Shawnee
5A Sheridan
5A Sherman
5A Smith
4A Stafford
4A Stanton
4A Stevens
4A Sumner
5A Thomas
4A Trego
4A Wabaunsee
5A Wallace
4A Washington
5A Wichita
4A Wilson
4A Woodson
4A Wyandotte
KENTUCKY
4A (all)
LOUISIANA
2A Acadia*
2A Allen*
2A Ascension*
2A Assumption*
2A Avoyelles*
2A Beauregard*
3A Bienville*
3A Bossier*
3A Caddo*
2A Calcasieu*
3A Caldwell*
2A Cameron*
3A Catahoula*
3A Claiborne*
3A Concordia*
3A De Soto*
2A East Baton Rouge*
3A East Carroll
2A East Feliciana*
2A Evangeline*
3A Franklin*
3A Grant*
2A Iberia*
2A Iberville*
3A Jackson*
2A Jefferson*
2A Jefferson Davis*
2A Lafayette*
2A Lafourche*
3A La Salle*
3A Lincoln*
2A Livingston*
3A Madison*
3A Morehouse
3A Natchitoches*
2A Orleans*
3A Ouachita*
2A Plaquemines*
2A Pointe Coupee*
2A Rapides*
3A Red River*
3A Richland*
3A Sabine*
2A St. Bernard*
2A St. Charles*
2A St. Helena*
2A St. James*
2A St. John the Baptist*
2A St. Landry*
2A St. Martin*
2A St. Mary*
2A St. Tammany*
2A Tangipahoa*
3A Tensas*
2A Terrebonne*
3A Union*
2A Vermilion*
3A Vernon*

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
LOUISIANA *(continued)*
2A Washington*
3A Webster*
2A West Baton Rouge*
3A West Carroll
2A West Feliciana*
3A Winn*
MAINE
6A Androscoggin
7 Aroostook
6A Cumberland
6A Franklin
6A Hancock
6A Kennebec
6A Knox
6A Lincoln
6A Oxford
6A Penobscot
6A Piscataquis
6A Sagadahoc
6A Somerset
6A Waldo
6A Washington
6A York
MARYLAND
5A Allegany
4A Anne Arundel
4A Baltimore
4A Baltimore (city)
4A Calvert
4A Caroline
4A Carroll
4A Cecil
4A Charles
4A Dorchester
4A Frederick
5A Garrett
4A Harford
4A Howard
4A Kent
4A Montgomery
4A Prince George's
4A Queen Anne's
4A Somerset
4A St. Mary's
4A Talbot
4A Washington
4A Wicomico
4A Worcester
MASSACHUSETTS
5A (all)
MICHIGAN
6A Alcona
6A Alger
5A Allegan
6A Alpena
6A Antrim
6A Arenac
6A Baraga
5A Barry
5A Bay
6A Benzie
5A Berrien
5A Branch
5A Calhoun
5A Cass
6A Charlevoix
6A Cheboygan
6A Chippewa
6A Clare
5A Clinton
6A Crawford
6A Delta
6A Dickinson
5A Eaton
6A Emmet
5A Genesee
6A Gladwin
6A Gogebic
6A Grand Traverse
5A Gratiot
5A Hillsdale
6A Houghton
5A Huron
5A Ingham
5A Ionia
6A Iosco
6A Iron
6A Isabella

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MICHIGAN *(continued)*
5A Jackson
5A Kalamazoo
6A Kalkaska
5A Kent
7 Keweenaw
6A Lake
5A Lapeer
6A Leelanau
5A Lenawee
5A Livingston
6A Luce
6A Mackinac
5A Macomb
6A Manistee
7 Marquette
6A Mason
6A Mecosta
6A Menominee
5A Midland
6A Missaukee
5A Monroe
5A Montcalm
6A Montmorency
5A Muskegon
6A Newaygo
5A Oakland
6A Oceana
6A Ogemaw
6A Ontonagon
6A Osceola
6A Oscoda
6A Otsego
5A Ottawa
6A Presque Isle
6A Roscommon
5A Saginaw
5A Sanilac
6A Schoolcraft
5A Shiawassee
5A St. Clair
5A St. Joseph
5A Tuscola
5A Van Buren
5A Washtenaw
5A Wayne
6A Wexford
MINNESOTA
7 Aitkin
6A Anoka
6A Becker
7 Beltrami
6A Benton
6A Big Stone
6A Blue Earth
6A Brown
7 Carlton
6A Carver
7 Cass
6A Chippewa
6A Chisago
6A Clay
7 Clearwater
7 Cook
6A Cottonwood
7 Crow Wing
6A Dakota
6A Dodge
6A Douglas
6A Faribault
5A Fillmore
6A Freeborn
6A Goodhue
6A Grant
6A Hennepin
5A Houston
7 Hubbard
6A Isanti
7 Itasca
6A Jackson
6A Kanabec
6A Kandiyohi
7 Kittson
7 Koochiching
6A Lac qui Parle
7 Lake
7 Lake of the Woods
6A Le Sueur
6A Lincoln

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MINNESOTA *(continued)*
6A Lyon
7 Mahnomen
7 Marshall
6A Martin
6A McLeod
6A Meeker
6A Mille Lacs
6A Morrison
6A Mower
6A Murray
6A Nicollet
6A Nobles
7 Norman
6A Olmsted
6A Otter Tail
7 Pennington
7 Pine
6A Pipestone
7 Polk
6A Pope
6A Ramsey
7 Red Lake
6A Redwood
6A Renville
6A Rice
6A Rock
7 Roseau
6A Scott
6A Sherburne
6A Sibley
6A Stearns
6A Steele
6A Stevens
7 St. Louis
6A Swift
6A Todd
6A Traverse
6A Wabasha
7 Wadena
6A Waseca
6A Washington
6A Watonwan
6A Wilkin
5A Winona
6A Wright
6A Yellow Medicine
MISSISSIPPI
3A Adams*
3A Alcorn
3A Amite*
3A Attala
3A Benton
3A Bolivar
3A Calhoun
3A Carroll
3A Chickasaw
3A Choctaw
3A Claiborne*
3A Clarke
3A Clay
3A Coahoma
3A Copiah*
3A Covington*
3A DeSoto
3A Forrest*
3A Franklin*
2A George*
3A Greene*
3A Grenada
2A Hancock*
2A Harrison*
3A Hinds*
3A Holmes
3A Humphreys
3A Issaquena
3A Itawamba
2A Jackson*
3A Jasper
3A Jefferson*
3A Jefferson Davis*
3A Jones*
3A Kemper
3A Lafayette
3A Lamar*
3A Lauderdale
3A Lawrence*
3A Leake
3A Lee

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MISSISSIPPI *(continued)*
3A Leflore
3A Lincoln*
3A Lowndes
3A Madison
3A Marion*
3A Marshall
3A Monroe
3A Montgomery
3A Neshoba
3A Newton
3A Noxubee
3A Oktibbeha
3A Panola
2A Pearl River*
3A Perry*
3A Pike*
3A Pontotoc
3A Prentiss
3A Quitman
3A Rankin*
3A Scott
3A Sharkey
3A Simpson*
3A Smith*
2A Stone*
3A Sunflower
3A Tallahatchie
3A Tate
3A Tippah
3A Tishomingo
3A Tunica
3A Union
3A Walthall*
3A Warren*
3A Washington
3A Wayne*
3A Webster
3A Wilkinson*
3A Winston
3A Yalobusha
3A Yazoo
MISSOURI
5A Adair
5A Andrew
5A Atchison
4A Audrain
4A Barry
4A Barton
4A Bates
4A Benton
4A Bollinger
4A Boone
4A Buchanan
4A Butler
4A Caldwell
4A Callaway
4A Camden
4A Cape Girardeau
4A Carroll
4A Carter
4A Cass
4A Cedar
4A Chariton
4A Christian
5A Clark
4A Clay
4A Clinton
4A Cole
4A Cooper
4A Crawford
4A Dade
4A Dallas
5A Daviess
5A DeKalb
4A Dent
4A Douglas
3A Dunklin
4A Franklin
4A Gasconade
5A Gentry
4A Greene
5A Grundy
5A Harrison
4A Henry
4A Hickory
5A Holt
4A Howard
4A Howell

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MISSOURI *(continued)*
4A Iron
4A Jackson
4A Jasper
4A Jefferson
4A Johnson
5A Knox
4A Laclede
4A Lafayette
4A Lawrence
5A Lewis
4A Lincoln
5A Linn
5A Livingston
5A Macon
4A Madison
4A Maries
5A Marion
4A McDonald
5A Mercer
4A Miller
4A Mississippi
4A Moniteau
4A Monroe
4A Montgomery
4A Morgan
4A New Madrid
4A Newton
5A Nodaway
4A Oregon
4A Osage
4A Ozark
3A Pemiscot
4A Perry
4A Pettis
4A Phelps
5A Pike
4A Platte
4A Polk
4A Pulaski
5A Putnam
5A Ralls
4A Randolph
4A Ray
4A Reynolds
4A Ripley
4A Saline
5A Schuyler
5A Scotland
4A Scott
4A Shannon
5A Shelby
4A St. Charles
4A St. Clair
4A St. Francois
4A St. Louis
4A St. Louis (city)
4A Ste. Genevieve
4A Stoddard
4A Stone
5A Sullivan
4A Taney
4A Texas
4A Vernon
4A Warren
4A Washington
4A Wayne
4A Webster
5A Worth
4A Wright
MONTANA
6B (all)
NEBRASKA
5A (all)
NEVADA
4B Carson City (city)
5B Churchill
3B Clark
4B Douglas
5B Elko
4B Esmeralda
5B Eureka
5B Humboldt
5B Lander
4B Lincoln
4B Lyon
4B Mineral
4B Nye
5B Pershing

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NEVADA *(continued)*
5B Storey
5B Washoe
5B White Pine
NEW HAMPSHIRE
6A Belknap
6A Carroll
5A Cheshire
6A Coos
6A Grafton
5A Hillsborough
5A Merrimack
5A Rockingham
5A Strafford
6A Sullivan
NEW JERSEY
4A Atlantic
5A Bergen
4A Burlington
4A Camden
4A Cape May
4A Cumberland
4A Essex
4A Gloucester
4A Hudson
5A Hunterdon
4A Mercer
4A Middlesex
4A Monmouth
5A Morris
4A Ocean
5A Passaic
4A Salem
5A Somerset
5A Sussex
4A Union
5A Warren
NEW MEXICO
4B Bernalillo
4B Catron
3B Chaves
4B Cibola
5B Colfax
4B Curry
4B DeBaca
3B Doña Ana
3B Eddy
4B Grant
4B Guadalupe
5B Harding
3B Hidalgo
3B Lea
4B Lincoln
5B Los Alamos
3B Luna
5B McKinley
5B Mora
3B Otero
4B Quay
5B Rio Arriba
4B Roosevelt
5B Sandoval
5B San Juan
5B San Miguel
5B Santa Fe
3B Sierra
4B Socorro
5B Taos
5B Torrance
4B Union
4B Valencia
NEW YORK
5A Albany
5A Allegany
4A Bronx
5A Broome
5A Cattaraugus
5A Cayuga
5A Chautauqua
5A Chemung
6A Chenango
6A Clinton
5A Columbia
5A Cortland
6A Delaware
5A Dutchess
5A Erie
6A Essex
6A Franklin

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NEW YORK *(continued)*
6A Fulton
5A Genesee
5A Greene
6A Hamilton
6A Herkimer
6A Jefferson
4A Kings
6A Lewis
5A Livingston
6A Madison
5A Monroe
6A Montgomery
4A Nassau
4A New York
5A Niagara
6A Oneida
5A Onondaga
5A Ontario
5A Orange
5A Orleans
5A Oswego
6A Otsego
5A Putnam
4A Queens
5A Rensselaer
4A Richmond
5A Rockland
5A Saratoga
5A Schenectady
5A Schoharie
5A Schuyler
5A Seneca
5A Steuben
6A St. Lawrence
4A Suffolk
6A Sullivan
5A Tioga
5A Tompkins
6A Ulster
6A Warren
5A Washington
5A Wayne
4A Westchester
5A Wyoming
5A Yates
NORTH CAROLINA
3A Alamance
3A Alexander
5A Alleghany
3A Anson
5A Ashe
5A Avery
3A Beaufort
3A Bertie
3A Bladen
3A Brunswick*
4A Buncombe
4A Burke
3A Cabarrus
4A Caldwell
3A Camden
3A Carteret*
3A Caswell
3A Catawba
3A Chatham
3A Cherokee
3A Chowan
3A Clay
3A Cleveland
3A Columbus*
3A Craven
3A Cumberland
3A Currituck
3A Dare
3A Davidson
3A Davie
3A Duplin
3A Durham
3A Edgecombe
3A Forsyth
3A Franklin
3A Gaston
3A Gates
4A Graham
3A Granville
3A Greene
3A Guilford
3A Halifax

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NORTH CAROLINA *(continued)*
3A Harnett
4A Haywood
4A Henderson
3A Hertford
3A Hoke
3A Hyde
3A Iredell
4A Jackson
3A Johnston
3A Jones
3A Lee
3A Lenoir
3A Lincoln
4A Macon
4A Madison
3A Martin
4A McDowell
3A Mecklenburg
4A Mitchell
3A Montgomery
3A Moore
3A Nash
3A New Hanover*
3A Northampton
3A Onslow*
3A Orange
3A Pamlico
3A Pasquotank
3A Pender*
3A Perquimans
3A Person
3A Pitt
3A Polk
3A Randolph
3A Richmond
3A Robeson
3A Rockingham
3A Rowan
3A Rutherford
3A Sampson
3A Scotland
3A Stanly
4A Stokes
4A Surry
4A Swain
4A Transylvania
3A Tyrrell
3A Union
3A Vance
3A Wake
3A Warren
3A Washington
5A Watauga
3A Wayne
3A Wilkes
3A Wilson
4A Yadkin
5A Yancey
NORTH DAKOTA
6A Adams
6A Barnes
7 Benson
6A Billings
7 Bottineau
6A Bowman
7 Burke
6A Burleigh
6A Cass
7 Cavalier
6A Dickey
7 Divide
6A Dunn
6A Eddy
6A Emmons
6A Foster
6A Golden Valley
7 Grand Forks
6A Grant
6A Griggs
6A Hettinger
6A Kidder
6A LaMoure
6A Logan
7 McHenry
6A McIntosh
6A McKenzie
6A McLean
6A Mercer

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NORTH DAKOTA *(continued)*
6A Morton
6A Mountrail
7 Nelson
6A Oliver
7 Pembina
7 Pierce
7 Ramsey
6A Ransom
7 Renville
6A Richland
7 Rolette
6A Sargent
6A Sheridan
6A Sioux
6A Slope
6A Stark
6A Steele
6A Stutsman
7 Towner
6A Traill
7 Walsh
7 Ward
6A Wells
6A Williams
OHIO
4A Adams
5A Allen
5A Ashland
5A Ashtabula
4A Athens
5A Auglaize
5A Belmont
4A Brown
4A Butler
5A Carroll
5A Champaign
5A Clark
4A Clermont
4A Clinton
5A Columbiana
5A Coshocton
5A Crawford
5A Cuyahoga
5A Darke
5A Defiance
5A Delaware
5A Erie
5A Fairfield
4A Fayette
4A Franklin
5A Fulton
4A Gallia
5A Geauga
4A Greene
5A Guernsey
4A Hamilton
5A Hancock
5A Hardin
5A Harrison
5A Henry
4A Highland
4A Hocking
5A Holmes
5A Huron
4A Jackson
5A Jefferson
5A Knox
5A Lake
4A Lawrence
5A Licking
5A Logan
5A Lorain
5A Lucas
4A Madison
5A Mahoning
5A Marion
5A Medina
4A Meigs
5A Mercer
5A Miami
5A Monroe
5A Montgomery
5A Morgan
5A Morrow
5A Muskingum
5A Noble
5A Ottawa
5A Paulding

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
OHIO *(continued)*
5A Perry
4A Pickaway
4A Pike
5A Portage
5A Preble
5A Putnam
5A Richland
4A Ross
5A Sandusky
4A Scioto
5A Seneca
5A Shelby
5A Stark
5A Summit
5A Trumbull
5A Tuscarawas
5A Union
5A Van Wert
4A Vinton
4A Warren
4A Washington
5A Wayne
5A Williams
5A Wood
5A Wyandot
OKLAHOMA
3A Adair
4A Alfalfa
3A Atoka
4B Beaver
3A Beckham
3A Blaine
3A Bryan
3A Caddo
3A Canadian
3A Carter
3A Cherokee
3A Choctaw
4B Cimarron
3A Cleveland
3A Coal
3A Comanche
3A Cotton
4A Craig
3A Creek
3A Custer
4A Delaware
3A Dewey
4A Ellis
4A Garfield
3A Garvin
3A Grady
4A Grant
3A Greer
3A Harmon
4A Harper
3A Haskell
3A Hughes
3A Jackson
3A Jefferson
3A Johnston
4A Kay
3A Kingfisher
3A Kiowa
3A Latimer
3A Le Flore
3A Lincoln
3A Logan
3A Love
4A Major
3A Marshall
3A Mayes
3A McClain
3A McCurtain
3A McIntosh
3A Murray
3A Muskogee
3A Noble
4A Nowata
3A Okfuskee
3A Oklahoma
3A Okmulgee
4A Osage
4A Ottawa
3A Pawnee
3A Payne
3A Pittsburg
3A Pontotoc

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
OKLAHOMA *(continued)*
3A Pottawatomie
3A Pushmataha
3A Roger Mills
3A Rogers
3A Seminole
3A Sequoyah
3A Stephens
4B Texas
3A Tillman
3A Tulsa
3A Wagoner
4A Washington
3A Washita
4A Woods
4A Woodward
OREGON
5B Baker
4C Benton
4C Clackamas
4C Clatsop
4C Columbia
4C Coos
5B Crook
4C Curry
5B Deschutes
4C Douglas
5B Gilliam
5B Grant
5B Harney
5B Hood River
4C Jackson
5B Jefferson
4C Josephine
5B Klamath
5B Lake
4C Lane
4C Lincoln
4C Linn
5B Malheur
4C Marion
5B Morrow
4C Multnomah
4C Polk
5B Sherman
4C Tillamook
5B Umatilla
5B Union
5B Wallowa
5B Wasco
4C Washington
5B Wheeler
4C Yamhill
PENNSYLVANIA
4A Adams
5A Allegheny
5A Armstrong
5A Beaver
5A Bedford
4A Berks
5A Blair
5A Bradford
4A Bucks
5A Butler
5A Cambria
5A Cameron
5A Carbon
5A Centre
4A Chester
5A Clarion
5A Clearfield
5A Clinton
5A Columbia
5A Crawford
4A Cumberland
4A Dauphin
4A Delaware
5A Elk
5A Erie
5A Fayette
5A Forest
4A Franklin
5A Fulton
5A Greene
5A Huntingdon
5A Indiana
5A Jefferson
5A Juniata
5A Lackawanna

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
PENNSYLVANIA *(continued)*
4A Lancaster
5A Lawrence
4A Lebanon
5A Lehigh
5A Luzerne
5A Lycoming
5A McKean
5A Mercer
5A Mifflin
5A Monroe
4A Montgomery
5A Montour
5A Northampton
5A Northumberland
4A Perry
4A Philadelphia
5A Pike
5A Potter
5A Schuylkill
5A Snyder
5A Somerset
5A Sullivan
5A Susquehanna
5A Tioga
5A Union
5A Venango
5A Warren
5A Washington
5A Wayne
5A Westmoreland
5A Wyoming
4A York
RHODE ISLAND
5A (all)
SOUTH CAROLINA
3A Abbeville
3A Aiken
3A Allendale*
3A Anderson
3A Bamberg*
3A Barnwell*
2A Beaufort*
3A Berkeley*
3A Calhoun
3A Charleston*
3A Cherokee
3A Chester
3A Chesterfield
3A Clarendon
3A Colleton*
3A Darlington
3A Dillon
3A Dorchester*
3A Edgefield
3A Fairfield
3A Florence
3A Georgetown*
3A Greenville
3A Greenwood
3A Hampton*
3A Horry*
2A Jasper*
3A Kershaw
3A Lancaster
3A Laurens
3A Lee
3A Lexington
3A Marion
3A Marlboro
3A McCormick
3A Newberry
3A Oconee
3A Orangeburg
3A Pickens
3A Richland
3A Saluda
3A Spartanburg
3A Sumter
3A Union
3A Williamsburg
3A York
SOUTH DAKOTA
6A Aurora
6A Beadle
5A Bennett
5A Bon Homme
6A Brookings
6A Brown

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
SOUTH DAKOTA *(continued)*
5A Brule
6A Buffalo
6A Butte
6A Campbell
5A Charles Mix
6A Clark
5A Clay
6A Codington
6A Corson
6A Custer
6A Davison
6A Day
6A Deuel
6A Dewey
5A Douglas
6A Edmunds
6A Fall River
6A Faulk
6A Grant
5A Gregory
5A Haakon
6A Hamlin
6A Hand
6A Hanson
6A Harding
6A Hughes
5A Hutchinson
6A Hyde
5A Jackson
6A Jerauld
5A Jones
6A Kingsbury
6A Lake
6A Lawrence
6A Lincoln
5A Lyman
6A Marshall
6A McCook
6A McPherson
6A Meade
5A Mellette
6A Miner
6A Minnehaha
6A Moody
6A Pennington
6A Perkins
6A Potter
6A Roberts
6A Sanborn
6A Shannon
6A Spink
5A Stanley
6A Sully
5A Todd
5A Tripp
6A Turner
5A Union
6A Walworth
5A Yankton
6A Ziebach
TENNESSEE
4A Anderson
3A Bedford
4A Benton
4A Bledsoe
4A Blount
4A Bradley
4A Campbell
4A Cannon
4A Carroll
4A Carter
4A Cheatham
3A Chester
4A Claiborne
4A Clay
4A Cocke
3A Coffee
3A Crockett
4A Cumberland
3A Davidson
3A Decatur
4A DeKalb
4A Dickson
3A Dyer
3A Fayette
4A Fentress
3A Franklin
3A Gibson

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TENNESSEE *(continued)*
3A Giles
4A Grainger
4A Greene
3A Grundy
4A Hamblen
3A Hamilton
4A Hancock
3A Hardeman
3A Hardin
4A Hawkins
3A Haywood
3A Henderson
4A Henry
3A Hickman
4A Houston
4A Humphreys
4A Jackson
4A Jefferson
4A Johnson
4A Knox
4A Lake
3A Lauderdale
3A Lawrence
3A Lewis
3A Lincoln
4A Loudon
4A Macon
3A Madison
3A Marion
3A Marshall
3A Maury
4A McMinn
3A McNairy
4A Meigs
4A Monroe
4A Montgomery
3A Moore
4A Morgan
4A Obion
4A Overton
3A Perry
4A Pickett
4A Polk
4A Putnam
4A Rhea
4A Roane
4A Robertson
3A Rutherford
4A Scott
4A Sequatchie
4A Sevier
3A Shelby
4A Smith
4A Stewart
4A Sullivan
4A Sumner
3A Tipton
4A Trousdale
4A Unicoi
4A Union
4A Van Buren
4A Warren
4A Washington
3A Wayne
4A Weakley
4A White
3A Williamson
4A Wilson
TEXAS
2A Anderson*
3B Andrews
2A Angelina*
2A Aransas*
3A Archer
4B Armstrong
2A Atascosa*
2A Austin*
4B Bailey
2B Bandera
2A Bastrop*
3B Baylor
2A Bee*
2A Bell*
2A Bexar*
3A Blanco*
3B Borden
2A Bosque*
3A Bowie*

(continued)

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
2A Brazoria*
2A Brazos*
3B Brewster
4B Briscoe
2A Brooks*
3A Brown*
2A Burleson*
3A Burnet*
2A Caldwell*
2A Calhoun*
3B Callahan
1A Cameron*
3A Camp*
4B Carson
3A Cass*
4B Castro
2A Chambers*
2A Cherokee*
3B Childress
3A Clay
4B Cochran
3B Coke
3B Coleman
3A Collin*
3B Collingsworth
2A Colorado*
2A Comal*
3A Comanche*
3B Concho
3A Cooke
2A Coryell*
3B Cottle
3B Crane
3B Crockett
3B Crosby
3B Culberson
4B Dallam
2A Dallas*
3B Dawson
4B Deaf Smith
3A Delta
3A Denton*
2A DeWitt*
3B Dickens
2B Dimmit
4B Donley
2A Duval*
3A Eastland
3B Ector
2B Edwards
2A Ellis*
3B El Paso
3A Erath*
2A Falls*
3A Fannin
2A Fayette*
3B Fisher
4B Floyd
3B Foard
2A Fort Bend*
3A Franklin*
2A Freestone*
2B Frio
3B Gaines
2A Galveston*
3B Garza
3A Gillespie*
3B Glasscock
2A Goliad*
2A Gonzales*
4B Gray
3A Grayson
3A Gregg*
2A Grimes*
2A Guadalupe*
4B Hale
3B Hall
3A Hamilton*
4B Hansford
3B Hardeman
2A Hardin*
2A Harris*
3A Harrison*
4B Hartley
3B Haskell
2A Hays*
3B Hemphill
3A Henderson*

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
1A Hidalgo*
2A Hill*
4B Hockley
3A Hood*
3A Hopkins*
2A Houston*
3B Howard
3B Hudspeth
3A Hunt*
4B Hutchinson
3B Irion
3A Jack
2A Jackson*
2A Jasper*
3B Jeff Davis
2A Jefferson*
2A Jim Hogg*
2A Jim Wells*
2A Johnson*
3B Jones
2A Karnes*
3A Kaufman*
3A Kendall*
2A Kenedy*
3B Kent
3B Kerr
3B Kimble
3B King
2B Kinney
2A Kleberg*
3B Knox
3A Lamar*
4B Lamb
3A Lampasas*
2B La Salle
2A Lavaca*
2A Lee*
2A Leon*
2A Liberty*
2A Limestone*
4B Lipscomb
2A Live Oak*
3A Llano*
3B Loving
3B Lubbock
3B Lynn
2A Madison*
3A Marion*
3B Martin
3B Mason
2A Matagorda*
2B Maverick
3B McCulloch
2A McLennan*
2A McMullen*
2B Medina
3B Menard
3B Midland
2A Milam*
3A Mills*
3B Mitchell
3A Montague
2A Montgomery*
4B Moore
3A Morris*
3B Motley
3A Nacogdoches*
2A Navarro*
2A Newton*
3B Nolan
2A Nueces*
4B Ochiltree
4B Oldham
2A Orange*
3A Palo Pinto*
3A Panola*
3A Parker*
4B Parmer
3B Pecos
2A Polk*
4B Potter
3B Presidio
3A Rains*
4B Randall
3B Reagan
2B Real
3A Red River*
3B Reeves

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
2A Refugio*
4B Roberts
2A Robertson*
3A Rockwall*
3B Runnels
3A Rusk*
3A Sabine*
3A San Augustine*
2A San Jacinto*
2A San Patricio*
3A San Saba*
3B Schleicher
3B Scurry
3B Shackelford
3A Shelby*
4B Sherman
3A Smith*
3A Somervell*
2A Starr*
3A Stephens
3B Sterling
3B Stonewall
3B Sutton
4B Swisher
2A Tarrant*
3B Taylor
3B Terrell
3B Terry
3B Throckmorton
3A Titus*
3B Tom Green
2A Travis*
2A Trinity*
2A Tyler*
3A Upshur*
3B Upton
2B Uvalde
2B Val Verde
3A Van Zandt*
2A Victoria*
2A Walker*
2A Waller*
3B Ward
2A Washington*
2B Webb
2A Wharton*
3B Wheeler
3A Wichita
3B Wilbarger
1A Willacy*
2A Williamson*
2A Wilson*
3B Winkler
3A Wise
3A Wood*
4B Yoakum
3A Young
2B Zapata
2B Zavala
UTAH
5B Beaver
5B Box Elder
5B Cache
5B Carbon
6B Daggett
5B Davis
6B Duchesne
5B Emery
5B Garfield
5B Grand
5B Iron
5B Juab
5B Kane
5B Millard
6B Morgan
5B Piute
6B Rich
5B Salt Lake
5B San Juan
5B Sanpete
5B Sevier
6B Summit
5B Tooele
6B Uintah
5B Utah
6B Wasatch
3B Washington
5B Wayne

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
UTAH *(continued)*
5B Weber
VERMONT
6A (all)
VIRGINIA
4A (all except as follows:)
5A Alleghany
5A Bath
3A Brunswick
3A Chesapeake
5A Clifton Forge
5A Covington
3A Emporia
3A Franklin
3A Greensville
3A Halifax
3A Hampton
5A Highland
3A Isle of Wight
3A Mecklenburg
3A Newport News
3A Norfolk
3A Pittsylvania
3A Portsmouth
3A South Boston
3A Southampton
3A Suffolk
3A Surry
3A Sussex
3A Virginia Beach
WASHINGTON
5B Adams
5B Asotin
5B Benton
5B Chelan
5C Clallam
4C Clark
5B Columbia
4C Cowlitz
5B Douglas
6B Ferry
5B Franklin
5B Garfield
5B Grant
4C Grays Harbor
5C Island
4C Jefferson
4C King
5C Kitsap
5B Kittitas
5B Klickitat
4C Lewis
5B Lincoln
4C Mason
5B Okanogan
4C Pacific
6B Pend Oreille
4C Pierce
5C San Juan
4C Skagit
5B Skamania
4C Snohomish
5B Spokane
6B Stevens
4C Thurston
4C Wahkiakum
5B Walla Walla
4C Whatcom
5B Whitman
5B Yakima
WEST VIRGINIA
5A Barbour
4A Berkeley
4A Boone
4A Braxton
5A Brooke
4A Cabell
4A Calhoun
4A Clay
4A Doddridge
4A Fayette
4A Gilmer
5A Grant
4A Greenbrier
5A Hampshire
5A Hancock
5A Hardy
5A Harrison
4A Jackson

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
WEST VIRGINIA *(continued)*
4A Jefferson
4A Kanawha
4A Lewis
4A Lincoln
4A Logan
5A Marion
5A Marshall
4A Mason
4A McDowell
4A Mercer
5A Mineral
4A Mingo
5A Monongalia
4A Monroe
4A Morgan
4A Nicholas
5A Ohio
5A Pendleton
4A Pleasants
5A Pocahontas
5A Preston
4A Putnam
4A Raleigh
5A Randolph
4A Ritchie
4A Roane
4A Summers
5A Taylor
5A Tucker
4A Tyler
4A Upshur
4A Wayne
4A Webster
5A Wetzel
4A Wirt
4A Wood
4A Wyoming
WISCONSIN
5A Adams
6A Ashland
6A Barron
6A Bayfield
6A Brown
6A Buffalo
6A Burnett
5A Calumet
6A Chippewa
6A Clark
5A Columbia
5A Crawford
5A Dane
5A Dodge
6A Door
6A Douglas
6A Dunn
6A Eau Claire
6A Florence
5A Fond du Lac
6A Forest
5A Grant
5A Green
5A Green Lake
5A Iowa
6A Iron
6A Jackson
5A Jefferson
5A Juneau
5A Kenosha
6A Kewaunee
5A La Crosse
5A Lafayette
6A Langlade
6A Lincoln
6A Manitowoc
6A Marathon
6A Marinette
6A Marquette
6A Menominee
5A Milwaukee
5A Monroe
6A Oconto
6A Oneida
5A Outagamie
5A Ozaukee
6A Pepin
6A Pierce
6A Polk
6A Portage

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TABLE C301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
WISCONSIN *(continued)*
6A Price
5A Racine
5A Richland
5A Rock
6A Rusk
5A Sauk
6A Sawyer
6A Shawano
6A Sheboygan
6A St. Croix
6A Taylor
6A Trempealeau
5A Vernon
6AVilas
5A Walworth
6A Washburn
5A Washington
5A Waukesha
6A Waupaca
5A Waushara
5A Winnebago
6A Wood
WYOMING
6B Albany
6B Big Horn
6B Campbell
6B Carbon
6B Converse
6B Crook
6B Fremont
5B Goshen
6B Hot Springs
6B Johnson
5B Laramie
7 Lincoln
6B Natrona
6B Niobrara
6B Park
5B Platte
6B Sheridan
7 Sublette
6B Sweetwater
7 Teton
6B Uinta
6B Washakie
6B Weston
US TERRITORIES
AMERICAN SAMOA
1A (all)*
GUAM
1A (all)*
NORTHERN MARIANA ISLANDS
1A (all)*
PUERTO RICO
1A (all except as follows:)*
2B Barraquitas
2B Cayey
VIRGIN ISLANDS
1A (all)*

a. Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a Warm Humid location.

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C301.3 Climate zone definitions. To determine the climate zones for locations not listed in this code, use the following information to determine climate zone numbers and letters in accordance with Items 1 through 5.

1. Determine the thermal climate zone, 0 through 8, from Table C301.3 using the heating (HDD) and cooling degree-days (CDD) for the location.
2. Determine the moisture zone (Marine, Dry or Humid) in accordance with Items 2.1 through 2.3.
   - 2.1. If monthly average temperature and precipitation data are available, use the Marine, Dry and Humid definitions to determine the moisture zone (C, B or A).
   - 2.2. If annual average temperature information (including degree-days) and annual precipitation (i.e., annual mean) are available, use Items 2.2.1 through 2.2.3 to determine the moisture zone. If the moisture zone is not Marine, then use the Dry definition to determine whether Dry or Humid.
     - 2.2.1. If thermal climate zone is 3 and CDD50°F ≤ 4,500 (CDD10°C ≤ 2500), climate zone is Marine (3C).
     - 2.2.2. If thermal climate zone is 4 and CDD50°F ≤ 2,700 (CDD10°C ≤ 1500), climate zone is Marine (4C).
     - 2.2.3. If thermal climate zone is 5 and CDD50°F ≤ 1,800 (CDD10°C ≤ 1000), climate zone is Marine (5C).
   - 2.3. If only degree-day information is available, use Items 2.3.1 through 2.3.3 to determine the moisture zone. If the moisture zone is not Marine, then it is not possible to assign Humid or Dry moisture zone for this location.
     - 2.3.1. If thermal climate zone is 3 and CDD50°F ≤ 4,500 (CDD10°C ≤ 2500), climate zone is Marine (3C).
     - 2.3.2. If thermal climate zone is 4 and CDD50°F ≤ 2,700 (CDD10°C ≤ 1500), climate zone is Marine (4C).
     - 2.3.3. If thermal climate zone is 5 and CDD50°F ≤ 1,800 (CDD10°C ≤ 1000), climate zone is Marine (5C).
3. Marine (C) Zone definition: Locations meeting all the criteria in Items 3.1 through 3.4.
   - 3.1. Mean temperature of coldest month between 27°F (-3°C) and 65°F (18°C).
   - 3.2. Warmest month mean < 72°F (22°C).
   - 3.3. Not fewer than four months with mean temperatures over 50°F (10°C).
   - 3.4. Dry season in summer. The month with the heaviest precipitation in the cold season has at least three times as much precipitation as the month with the least precipitation in the rest of the year. The cold season is October through March in the Northern Hemisphere and April through September in the Southern Hemisphere.
4. Dry (B) definition: Locations meeting the criteria in Items 4.1 through 4.4.
   - 4.1. Not Marine (C).
   - 4.2. If 70 percent or more of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-1.

     $P < 0.44 \times (T - 7)$
     [$P < 20.0 \times (T + 14)$ in SI units]
     (Equation 3-1)

     where:
     P = Annual precipitation, inches (mm).
     T = Annual mean temperature, °F (°C).
   - 4.3. If between 30 and 70 percent of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-2.

     $P < 0.44 \times (T - 19.5)$
     [$P < 20.0 \times (T + 7)$ in SI units]
     (Equation 3-2)

     where:
     P = Annual precipitation, inches (mm).
     T = Annual mean temperature, °F (°C).
   - 4.4. If 30 percent or less of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-3.

     $P < 0.44 \times (T - 32)$
     [$P < 20.0 \times T$ in SI units]
     (Equation 3-3)

     where:
     P = Annual precipitation, inches (mm).
     T = Annual mean temperature, °F (°C).
5. Humid (A) definition: Locations that are not Marine (C) or Dry (B).

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TABLE C301.3
THERMAL CLIMATE ZONE DEFINITIONS

ZONE NUMBER	THERMAL CRITERIA	
	IP Units	SI Units
0	10,800 < CDD50°F	6000 < CDD10°C
1	9,000 < CDD50°F < 10,800	5000 < CDD10°C < 6000
2	6,300 < CDD50°F ≤ 9,000	3500 < CDD10°C ≤ 5000
3	CDD50°F ≤ 6,300 AND HDD65°F ≤ 3,600	CDD10°C < 3500 AND HDD18°C ≤ 2000
4	CDD50°F ≤ 6,300 AND 3,600 < HDD65°F ≤ 5,400	CDD10°C < 3500 AND 2000 < HDD18°C ≤ 3000
5	CDD50°F < 6,300 AND 5,400 < HDD65°F ≤ 7,200	CDD10°C < 3500 AND 3000 < HDD18°C ≤ 4000
6	7,200 < HDD65°F ≤ 9,000	4000 < HDD18°C ≤ 5000
7	9,000 < HDD65°F ≤ 12,600	5000 < HDD18°C ≤ 7000
8	12,600 < HDD65°F	7000 < HDD18°C

For SI: °C = [(°F) – 32]/1.8.

C301.4 Tropical climate region. The tropical climate region shall be defined as:

1. Hawaii, Puerto Rico, Guam, American Samoa, US Virgin Islands, Commonwealth of Northern Mariana Islands; and
2. Islands in the area between the Tropic of Cancer and the Tropic of Capricorn.

SECTION C302
DESIGN CONDITIONS

C302.1 Interior design conditions. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.

SECTION C303
MATERIALS, SYSTEMS AND EQUIPMENT

C303.1 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

C303.1.1 Building thermal envelope insulation. An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternatively, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown-in or sprayed fiberglass and cellulose insulation, the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be indicated on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and *R*-value of installed thickness shall be indicated on the certification. For insulated siding, the *R*-value shall be labeled on the product's package and shall be indicated on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

Exception: For roof insulation installed above the deck, the *R*-value shall be labeled as required by the material standards specified in Table 1508.2 of the *International Building Code*.

C303.1.1.1 Blown-in or sprayed roof/ceiling insulation. The thickness of blown-in or sprayed fiberglass and cellulose roof/ceiling insulation shall be written in inches (mm) on markers and one or more of such markers shall be installed for every 300 square feet (28 m^2) of attic area throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers not less than 1 inch (25 mm) in height. Each marker shall face the attic *access* opening. Spray polyurethane foam thickness and installed *R*-value shall be indicated on certification provided by the insulation installer.

C303.1.2 Insulation mark installation. Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection. For insulation materials that are installed without an observable manufacturer's *R*-value mark, such as blown or draped products, an insulation certificate complying with Section C303.1.1 shall be left immediately after installation by the installer, in a conspicuous location within the building, to certify the installed *R*-value of the insulation material.

C303.1.3 Fenestration product rating. *U*-factors of fenestration products shall be determined as follows:

1. For windows, doors and skylights, *U*-factor ratings shall be determined in accordance with NFRC 100.
2. Where required for garage doors and rolling doors, *U*-factor ratings shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

U-factors shall be determined by an accredited, independent laboratory, and *labeled* and certified by the manufacturer.

Products lacking such a *labeled U*-factor shall be assigned a default *U*-factor from Table C303.1.3(1) or Table C303.1.3(2). The *solar heat gain coefficient* (SHGC) and *visible transmittance* (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and *labeled* and certified by the manufacturer. Products lacking such a *labeled* SHGC or VT shall be assigned a default SHGC or VT from Table C303.1.3(3). For Tubular Daylighting Devices, VT_{annual} shall be measured and rated in accordance with NFRC 203.

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TABLE C303.1.3(1)
DEFAULT GLAZED WINDOW, GLASS DOOR AND SKYLIGHT *U*-FACTORS

FRAME TYPE	WINDOW AND GLASS DOOR		SKYLIGHT	
	Single	Double	Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

TABLE C303.1.3(2)
DEFAULT OPAQUE DOOR *U*-FACTORS

DOOR TYPE	OPAQUE *U*-FACTOR
Uninsulated Metal	1.20
Insulated Metal (Rolling)	0.90
Insulated Metal (Other)	0.60
Wood	0.50
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

TABLE C303.1.3(3)
DEFAULT GLAZED FENESTRATION SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

C303.1.4 Insulation product rating. The thermal resistance (*R*-value) of insulation shall be determined in accordance with the US Federal Trade Commission *R*-value rule (CFR Title 16, Part 460) in units of h × ft^2 × °F/Btu at a mean temperature of 75°F (24°C).

C303.1.4.1 Insulated siding. The thermal resistance (*R*-value) of insulated siding shall be determined in accordance with ASTM C1363. Installation for testing shall be in accordance with the manufacturer's instructions.

C303.2 Installation. Materials, systems and equipment shall be installed in accordance with the manufacturer's instructions and the *International Building Code*.

C303.2.1 Protection of exposed foundation insulation. Insulation applied to the exterior of basement walls, crawl space walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend not less than 6 inches (153 mm) below grade.

C303.2.2 Multiple layers of continuous insulation board. Where two or more layers of continuous insulation board are used in a construction assembly, the continuous insulation boards shall be installed in accordance with Section C303.2. Where the continuous insulation board manufacturer's instructions do not address installation of two or more layers, the edge joints between each layer of continuous insulation boards shall be staggered.

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CHAPTER 4 [CE]
COMMERCIAL ENERGY EFFICIENCY

User note:

About this chapter: *Chapter 4 presents the paths and options for compliance with the energy efficiency provisions. Chapter 4 contains energy efficiency provisions for the building envelope, mechanical and water heating systems, lighting and additional efficiency requirements. A performance alternative is also provided to allow for energy code compliance other than by the prescriptive method.*

SECTION C401
GENERAL

C401.1 Scope. The provisions in this chapter are applicable to commercial *buildings* and their *building sites*.

C401.2 Application. Commercial buildings shall comply with Section C401.2.1 or C401.2.2.

*

C401.2.1 International Energy Conservation Code. Commercial buildings shall comply with one of the following:

1. Prescriptive Compliance. The Prescriptive Compliance option requires compliance with Sections C402 through C406 and Section C408. Dwelling units and sleeping units in Group R-2 buildings without systems serving multiple units shall be deemed to be in compliance with this chapter, provided that they comply with Section R406.
2. Total Building Performance. The Total Building Performance option requires compliance with Section C407.

Exception: Additions, alterations, repairs and changes of occupancy to existing buildings complying with Chapter 5.

C401.2.2 ASHRAE 90.1. Commercial buildings shall comply with the requirements of ANSI/ASHRAE/IESNA 90.1.

C401.3 Thermal envelope certificate. A permanent thermal envelope certificate shall be completed by an *approved* party. Such certificate shall be posted on a wall in the space where the space conditioning equipment is located, a utility room or other *approved* location. If located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. A copy of the certificate shall also be included in the construction files for the project. The certificate shall include the following:

1. *R*-values of insulation installed in or on ceilings, roofs, walls, foundations and slabs, *basement walls*, crawl space walls and floors and ducts outside *conditioned spaces*.
2. *U*-factors and *solar heat gain coefficients* (SHGC) of fenestrations.
3. Results from any *building* envelope air leakage testing performed on the *building*.

Where there is more than one value for any component of the building envelope, the certificate shall indicate the area-weighted average value where available. If the area-weighted average is not available, the certificate shall list each value that applies to 10 percent or more of the total component area.

SECTION C402
BUILDING ENVELOPE REQUIREMENTS

C402.1 General. *Building thermal envelope* assemblies for buildings that are intended to comply with the code on a prescriptive basis in accordance with the compliance path described in Item 1 of Section C401.2.1 shall comply with the following:

1. The opaque portions of the *building thermal envelope* shall comply with the specific insulation requirements of Section C402.2 and the thermal requirements of either the *R*-value-based method of Section C402.1.3; the *U*-, *C*- and *F*-factor-based method of Section C402.1.4; or the component performance alternative of Section C402.1.5.
2. Roof solar reflectance and thermal emittance shall comply with Section C402.3.
3. Fenestration in building envelope assemblies shall comply with Section C402.4.
4. Air leakage of building envelope assemblies shall comply with Section C402.5.

Alternatively, where buildings have a vertical fenestration area or skylight area exceeding that allowed in Section C402.4, the building and *building thermal envelope* shall comply with Item 2 of Section C401.2.1 or Section C401.2.2.

Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with Section C403.11.

C402.1.1 Low-energy buildings and greenhouses. The following low-energy buildings, or portions thereof separated from the remainder of the building by *building thermal envelope* assemblies complying with this section, shall be exempt from the *building thermal envelope* provisions of Section C402.

1. Those with a peak design rate of energy usage less than 3.4 Btu/h × ft^2 (10.7 W/m^2) or 1.0 watt per

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square foot (10.7 W/m^2) of floor area for space conditioning purposes.

2. Those that do not contain *conditioned space*.

C402.1.1.1 Greenhouses. Greenhouse structures or areas that are mechanically heated or cooled and that comply with all of the following shall be exempt from the building envelope requirements of this code:

1. Exterior opaque envelope assemblies comply with Sections C402.2 and C402.4.5.

   Exception: Low energy greenhouses that comply with Section C402.1.1.

2. Interior partition *building thermal envelope* assemblies that separate the greenhouse from *conditioned space* comply with Sections C402.2, C402.4.3 and C402.4.5.
3. Fenestration assemblies that comply with the thermal envelope requirements in Table C402.1.1.1. The *U*-factor for a roof shall be for the roof assembly or a roof that includes the assembly and an *internal curtain system*.

   Exception: Unconditioned greenhouses.

TABLE C402.1.1.1
FENESTRATION THERMAL ENVELOPE MAXIMUM REQUIREMENTS

COMPONENT	*U*-FACTOR (BTU/h × ft^2 × °F)
Skylight	0.5
Vertical fenestration	0.7

C402.1.2 Equipment buildings. Buildings that comply with the following shall be exempt from the *building thermal envelope* provisions of this code:

1. Are separate buildings with floor area not more than 1,200 square feet (110 m^2).
2. Are intended to house electric equipment with installed equipment power totaling not less than 7 watts per square foot (75 W/m^2) and not intended for human occupancy.
3. Have a heating system capacity not greater than (17,000 Btu/hr) (5 kW) and a heating thermostat setpoint that is restricted to not more than 50°F (10°C).
4. Have an average wall and roof *U*-factor less than 0.200 in *Climate Zones* 1 through 5 and less than 0.120 in *Climate Zones* 6 through 8.
5. Comply with the roof solar reflectance and thermal emittance provisions for *Climate Zone* 1.

C402.1.3 Insulation component *R*-value-based method. *Building thermal envelope* opaque assemblies shall comply with the requirements of Sections C402.2 and C402.4 based on the *climate zone* specified in Chapter 3. For opaque portions of the *building thermal envelope* intended to comply on an insulation component *R*-value basis, the *R*-values for cavity insulation and continuous insulation shall be not less than that specified in Table C402.1.3. Where cavity insulation is installed in multiple layers, the cavity insulation *R*-values shall be summed to determine compliance with the cavity insulation *R*-value requirements. Where continuous insulation is installed in multiple layers, the continuous insulation *R*-values shall be summed to determine compliance with the continuous insulation *R*-value requirements. Cavity insulation *R*-values shall not be used to determine compliance with the continuous insulation *R*-value requirements in Table C402.1.3. Commercial buildings or portions of commercial buildings enclosing *Group R* occupancies shall use the *R*-values from the "*Group R*" column of Table C402.1.3. Commercial buildings or portions of commercial buildings enclosing occupancies other than *Group R* shall use the *R*-values from the "All other" column of Table C402.1.3.

C402.1.4 Assembly *U*-factor, *C*-factor or *F*-factor-based method. *Building thermal envelope* opaque assemblies shall meet the requirements of Sections C402.2 and C402.4 based on the climate zone specified in Chapter 3. *Building thermal envelope* opaque assemblies intended to comply on an assembly *U*-, *C*- or *F*-factor basis shall have a *U*-, *C*- or *F*-factor not greater than that specified in Table C402.1.4. Commercial buildings or portions of commercial buildings enclosing *Group R* occupancies shall use the *U*-, *C*- or *F*-factor from the "*Group R*" column of Table C402.1.4. Commercial buildings or portions of commercial buildings enclosing occupancies other than *Group R* shall use the *U*-, *C*- or *F*-factor from the "All other" column of Table C402.1.4

C402.1.4.1 Roof/ceiling assembly. The maximum roof/ceiling assembly *U*-factor shall not exceed that specified in Table C402.1.4 based on construction materials used in the roof/ceiling assembly.

C402.1.4.1.1 Tapered, above-deck insulation based on thickness. Where used as a component of a maximum roof/ceiling assembly *U*-factor calculation, the sloped roof insulation *R*-value contribution to that calculation shall use the average thickness in inches (mm) along with the material *R*-value-per-inch (per-mm) solely for *U*-factor compliance as prescribed in Section C402.1.4.

C402.1.4.1.2 Suspended ceilings. Insulation installed on suspended ceilings having removable ceiling tiles shall not be considered part of the assembly *U*-factor of the roof/ceiling construction.

C402.1.4.1.3 Joints staggered. Continuous insulation board shall be installed in not less than two layers, and the edge joints between each layer of insulation shall be staggered, except where insulation tapers to the roof deck at a gutter edge, roof drain or scupper.

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TABLE C402.1.3
OPAQUE THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, *R*-VALUE METHOD[a]

CLIMATE ZONE	0 AND 1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above roof deck	R-20ci	R-25ci	R-25ci	R-25ci	R-25ci	R-25ci	R-30ci	R-30ci	R-30ci	R-30ci	R-30ci	R-30ci	R-35ci	R-35ci	R-35ci	R-35ci
Metal buildings[b]	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-19 + R-11 LS	R-25 + R-11 LS	R-30 + R-11 LS	R-30 + R-11 LS	R-30 + R-11 LS	R-25 + R-11 + R-11 LS	R-25 + R-11 + R-11 LS
Attic and other	R-38	R-38	R-38	R-38	R-38	R-38	R-49	R-49	R-49	R-49	R-49	R-49	R-60	R-60	R-60	R-60
Walls, above grade																
Mass[f]	R-5.7ci[c]	R-5.7ci[c]	R-5.7ci[c]	R-7.6ci	R-7.6ci	R-9.5ci	R-9.5ci	R-11.4ci	R-11.4ci	R-13.3ci	R-13.3ci	R-15.2ci	R-15.2ci	R-15.2ci	R-25ci	R-25ci
Metal building	R-13 + R-6.5ci	R-13 + R-6.5ci	R13 + R-6.5ci	R-13 + R-13ci	R-13 + R-6.5ci	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-14ci	R-13 + R-14ci	R-13 + R-14ci	R-13 + R-14ci	R-13 + R-14ci	R-13 + R-17ci	R-13 + R-19.5ci	R-13 + R-19.5ci	R-13 + R-19.5ci
Metal framed	R-13 + R-5ci	R-13 + R-5ci	R-13 + R-5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-10ci	R-13 + R-10ci	R-13 + R-12.5ci	R-13 + R-12.5ci	R-13 + R-12.5ci	R-13 + R-15.6ci	R-13 + R-18.8ci	R-13 + R-18.8ci
Wood framed and other	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-7.5ci or R20 + R3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-7.5ci or R-20 + R-3.8ci	R-13 + R-18.8ci	R-13 + R-18.8ci
Walls, below grade																
Below-grade wall[d]	NR	NR	NR	NR	NR	NR	R-7.5ci	R-10ci	R-7.5ci	R-10ci	R-10ci	R-15ci	R-15ci	R-15ci	R-15ci	R-15ci
Floors																
Mass[e]	NR	NR	R-6.3ci	R-8.3ci	R-10ci	R-10ci	R-14.6ci	R-16.7ci	R-14.6ci	R-16.7ci	R-16.7ci	R-16.7ci	R-20.9ci	R-20.9ci	R-23ci	R-23ci
Joist/framing	R-13	R-13	R-30	R-30	R-30	R-30	R-30	R-30	R-30	R-30	R-38	R-38	R-38	R-38	R-38	R-38
Slab-on-grade floors																
Unheated slabs	NR	NR	NR	NR	NR	R-10 for 24″ below	R-15 for 24″ below	R-15 for 24″ below	R-15 for 24″ below	R-20 for 24″ below	R-20 for 24″ below	R-20 for 48″ below	R-20 for 24″ below	R-20 for 48″ below	R-20 for 48″ below	R-25 for 48″ below
Heated slabs[g]	R-7.5 for 12″ below+ R-5 full slab	R-7.5 for 12″ below+ R-5 full slab	R-7.5 for 12″ below+ R-5 full slab	R-7.5 for 12″ below+ R-5 full slab	R-10 for 24″ below+ R-5 full slab	R-10 for 24″ below+ R-5 full slab	R-15 for 24″ below+ R-5 full slab	R-15 for 24″ below+ R-5 full slab	R-15 for 36″ below+ R-5 full slab	R-15 for 36″ below+ R-5 full slab	R-15 for 36″ below+ R-5 full slab	R-20 for 48″ below+ R-5 full slab	R-20 for 48″ below+ R-5 full slab	R-20 for 48″ below+ R-5 full slab	R-20 for 48″ below+ R-5 full slab	R-20 for 48″ below+ R-5 full slab

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 4.88 kg/m^2, 1 pound per cubic foot = 16 kg/m^3.

ci = Continuous Insulation, NR = No Requirement, LS = Liner System.

a. Assembly descriptions can be found in ANSI/ASHRAE/IESNA 90.1 Appendix A.

b. Where using *R*-value compliance method, a thermal spacer block shall be provided, otherwise use the *U*-factor compliance method in Table C402.1.4.

c. R-5.7ci is allowed to be substituted with concrete block walls complying with ASTM C90, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with materials having a maximum thermal conductivity of 0.44 Btu-in/h-f^2 °F.

d. Where heated slabs are below grade, below-grade walls shall comply with the exterior insulation requirements for heated slabs.

e. "Mass floors" shall be in accordance with Section C402.2.3.

f. "Mass walls" shall be in accordance with Section C402.2.2.

g. The first value is for perimeter insulation and the second value is for full, under-slab insulation. Perimeter insulation is not required to extend below the bottom of the slab.

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TABLE C402.1.4
OPAQUE THERMAL ENVELOPE ASSEMBLY MAXIMUM REQUIREMENTS, *U*-FACTOR METHOD[a, b]

CLIMATE ZONE	0 AND 1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above roof deck	U-0.048	U-0.039	U-0.039	U-0.039	U-0.039	U-0.039	U-0.032	U-0.032	U-0.032	U-0.032	U-0.032	U-0.032	U-0.028	U-0.028	U-0.028	U-0.028
Metal buildings	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.031	U-0.029	U-0.029	U-0.029	U-0.026	U-0.026
Attic and other	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021	U-0.017	U-0.017	U-0.017	U-0.017
Walls, above grade																
Mass[f]	U-0.151	U-0.151	U-0.151	U-0.123	U-0.123	U-0.104	U-0.104	U-0.090	U-0.090	U-0.080	U-0.080	U-0.071	U-0.071	U-0.071	U-0.037	U-0.037
Metal building	U-0.079	U-0.079	U-0.079	U-0.079	U-0.079	U-0.052	U-0.052	U-0.050	U-0.050	U-0.050	U-0.050	U-0.050	U-0.044	U-0.039	U-0.039	U-0.039
Metal framed	U-0.077	U-0.077	U-0.077	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.055	U-0.055	U-0.049	U-0.049	U-0.049	U-0.042	U-0.037	U-0.037
Wood framed and other[c]	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.051	U-0.051	U-0.051	U-0.051	U-0.051	U-0.051	U-0.032	U-0.032
Walls, below grade																
Below-grade wall[c]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-0.119	C-0.092	C-0.119	C-0.092	C-0.092	C-0.063	C-0.063	C-0.063	C-0.063	C-0.063
Floors																
Mass[d]	U-0.322[e]	U-0.322[e]	U-0.107	U-0.087	U-0.074	U-0.074	U-0.057	U-0.051	U-0.057	U-0.051	U-0.051	U-0.051	U-0.042	U-0.042	U-0.038	U-0.038
Joist/framing	U-0.066[e]	U-0.066[e]	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027
Slab-on-grade floors																
Unheated slabs	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.54	F-0.52	F-0.52	F-0.52	F-0.51	F-0.51	F-0.434	F-0.51	F-0.434	F-0.434	F-0.424
Heated slabs	F-0.69	F-0.69	F-0.69	F-0.69	F-0.66	F-0.66	F-0.62	F-0.62	F-0.62	F-0.62	F-0.62	F-0.602	F-0.602	F-0.602	F-0.602	F-0.602
Opaque doors																
Nonswinging door	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31
Swinging door[g]	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37
Garage door < 14% glazing[h]	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31

For SI: 1 pound per square foot = 4.88 kg/m^2, 1 pound per cubic foot = 16 kg/m^3.

ci = Continuous Insulation, NR = No Requirement, LS = Liner System.

a. Where assembly *U*-factors, *C*-factors and *F*-factors are established in ANSI/ASHRAE/IESNA 90.1 Appendix A, such opaque assemblies shall be a compliance alternative where those values meet the criteria of this table, and provided that the construction, excluding the cladding system on walls, complies with the appropriate construction details from ANSI/ASHRAE/ISNEA 90.1 Appendix A.

b. Where *U*-factors have been established by testing in accordance with ASTM C1363, such opaque assemblies shall be a compliance alternative where those values meet the criteria of this table. The *R*-value of continuous insulation shall be permitted to be added to or subtracted from the original tested design.

c. Where heated slabs are below grade, below-grade walls shall comply with the *U*-factor requirements for above-grade mass walls.

d. "Mass floors" shall be in accordance with Section C402.2.3.

e. These *C*-, *F*- and *U*-factors are based on assemblies that are not required to contain insulation.

f. "Mass walls" shall be in accordance with Section C402.2.2.

g. Swinging door *U*-factors shall be determined in accordance with NFRC-100.

h. Garage doors having a single row of fenestration shall have an assembly *U*-factor less than or equal to 0.44 in Climate Zones 0 through 6 and less than or equal to 0.36 in Climate Zones 7 and 8, provided that the fenestration area is not less than 14 percent and not more than 25 percent of the total door area.

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C402.1.4.2 Thermal resistance of cold-formed steel walls. *U*-factors of walls with cold-formed steel studs shall be permitted to be determined in accordance with Equation 4-1.

$$U = 1/[R_s + (ER)] \quad \textbf{(Equation 4-1)}$$

where:

R_s = The cumulative *R*-value of the wall components along the path of heat transfer, excluding the *cavity insulation* and steel studs.

ER = The effective *R*-value of the *cavity insulation* with steel studs as specified in Table C402.1.4.2.

TABLE C402.1.4.2
EFFECTIVE *R*-VALUES FOR STEEL STUD WALL ASSEMBLIES

NOMINAL STUD DEPTH (inches)	SPACING OF FRAMING (inches)	CAVITY *R*-VALUE (insulation)	CORRECTION FACTOR (F_c)	EFFECTIVE *R*-VALUE (ER) (Cavity *R*-Value × F_c)
$3^1/_2$	16	13	0.46	5.98
		15	0.43	6.45
$3^1/_2$	24	13	0.55	7.15
		15	0.52	7.80
6	16	19	0.37	7.03
		21	0.35	7.35
6	24	19	0.45	8.55
		21	0.43	9.03
8	16	25	0.31	7.75
	24	25	0.38	9.50

For SI: 1 inch = 25.4 mm.

C402.1.5 Component performance alternative. Building envelope values and fenestration areas determined in accordance with Equation 4-2 shall be an alternative to compliance with the *U*-, *F*- and *C*-factors in Tables C402.1.4 and C402.4 and the maximum allowable fenestration areas in Section C402.4.1. *Fenestration* shall meet the applicable SHGC requirements of Section C402.4.3.

$$A + B + C + D + E \le \text{Zero} \quad \textbf{(Equation 4-2)}$$

where:

A = Sum of the (UA Dif) values for each distinct assembly type of the *building thermal envelope*, other than slabs on grade and below-grade walls.

UA Dif = UA Proposed – UA Table.

UA Proposed = Proposed *U*-value × Area.

UA Table = (*U*-factor from Table C402.1.3, C402.1.4 or C402.4) × Area.

B = Sum of the (FL Dif) values for each distinct slab-on-grade perimeter condition of the *building thermal envelope*.

FL Dif = FL Proposed – FL Table.

FL Proposed = Proposed *F*-value × Perimeter length.

FL Table = (*F*-factor specified in Table C402.1.4) × Perimeter length.

C = Sum of the (CA Dif) values for each distinct *below-grade wall* assembly type of the *building thermal envelope*.

CA Dif = CA Proposed – CA Table.

CA Proposed = Proposed *C*-value × Area.

CA Table = (Maximum allowable *C*-factor specified in Table C402.1.4) × Area.

Where the proposed vertical glazing area is less than or equal to the maximum vertical glazing area allowed by Section C402.4.1, the value of D (Excess Vertical Glazing Value) shall be zero. Otherwise:

D = (DA × UV) – (DA × U Wall), but not less than zero.

DA = (Proposed Vertical Glazing Area) – (Vertical Glazing Area allowed by Section C402.4.1).

UA Wall = Sum of the (UA Proposed) values for each opaque assembly of the exterior wall.

U Wall = Area-weighted average *U*-value of all above-grade wall assemblies.

UAV = Sum of the (UA Proposed) values for each vertical glazing assembly.

UV = UAV/total vertical glazing area.

Where the proposed skylight area is less than or equal to the skylight area allowed by Section C402.4.1, the value of E (Excess Skylight Value) shall be zero. Otherwise:

E = (EA × US) – (EA × U Roof), but not less than zero.

EA = (Proposed Skylight Area) – (Allowable Skylight Area as specified in Section C402.4.1).

U Roof = Area-weighted average *U*-value of all roof assemblies.

UAS = Sum of the (UA Proposed) values for each skylight assembly.

US = UAS/total skylight area.

C402.2 Specific building thermal envelope insulation requirements. Insulation in *building thermal envelope* opaque assemblies shall comply with Sections C402.2.1 through C402.2.7 and Table C402.1.3.

C402.2.1 Roof assembly. The minimum thermal resistance (*R*-value) of the insulating material installed either between the roof framing or continuously on the roof assembly shall be as specified in Table C402.1.3, based on construction materials used in the roof assembly.

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C402.2.1.1 Tapered, above-deck insulation based on thickness. Where used as a component of a roof/ceiling assembly *R*-value calculation, the sloped roof insulation *R*-value contribution to that calculation shall use the average thickness in inches (mm) along with the material *R*-value-per-inch (per-mm) solely for *R*-value compliance as prescribed in Section 402.1.3.

C402.2.1.2 Minimum thickness, lowest point. The minimum thickness of above-deck roof insulation at its lowest point, gutter edge, roof drain or scupper, shall be not less than 1 inch (25 mm).

C402.2.1.3 Suspended ceilings. Insulation installed on suspended ceilings having removable ceiling tiles shall not be considered part of the minimum thermal resistance (*R*-value) of roof insulation in roof/ceiling construction.

C402.2.1.4 Joints staggered. Continuous insulation board shall be installed in not less than two layers and the edge joints between each layer of insulation shall be staggered, except where insulation tapers to the roof deck at a gutter edge, roof drain or scupper.

C402.2.1.5 Skylight curbs. Skylight curbs shall be insulated to the level of roofs with insulation entirely above the deck or R-5, whichever is less.

Exception: Unit skylight curbs included as a component of a skylight listed and labeled in accordance with NFRC 100 shall not be required to be insulated.

C402.2.2 Above-grade walls. The minimum thermal resistance (*R*-value) of materials installed in the wall cavity between framing members and continuously on the walls shall be as specified in Table C402.1.3, based on framing type and construction materials used in the wall assembly. The *R*-value of integral insulation installed in concrete masonry units shall not be used in determining compliance with Table C402.1.3 except as otherwise noted in the table. In determining compliance with Table C402.1.4, the use of the *U*-factor of concrete masonry units with integral insulation shall be permitted.

"Mass walls" where used as a component in the thermal envelope of a building shall comply with one of the following:

1. Weigh not less than 35 pounds per square foot (171 kg/m^2) of wall surface area.
2. Weigh not less than 25 pounds per square foot (122 kg/m^2) of wall surface area where the material weight is not more than 120 pcf (1900 kg/m^3).
3. Have a heat capacity exceeding 7 Btu/ft^2 × °F (144 kJ/m^2 × K).
4. Have a heat capacity exceeding 5 Btu/ft^2 × °F (103 kJ/m^2 × K), where the material weight is not more than 120 pcf (1900 kg/m^3).

C402.2.3 Floors. The thermal properties (component *R*-values or assembly *U*-, *C*- or *F*-factors) of floor assemblies over outdoor air or unconditioned space shall be as specified in Table C402.1.3 or C402.1.4 based on the construction materials used in the floor assembly. Floor framing *cavity insulation* or structural slab insulation shall be installed to maintain permanent contact with the underside of the subfloor decking or structural slabs.

"Mass floors" where used as a component of the thermal envelope of a building shall provide one of the following weights:

1. 35 pounds per square foot (171 kg/m^2) of floor surface area.
2. 25 pounds per square foot (122 kg/m^2) of floor surface area where the material weight is not more than 120 pounds per cubic foot (1923 kg/m^3).

Exceptions:

1. The floor framing *cavity insulation* or structural slab insulation shall be permitted to be in contact with the top side of sheathing or continuous insulation installed on the bottom side of floor assemblies where combined with insulation that meets or exceeds the minimum *R*-value in Table C402.1.3 for "Metal framed" or "Wood framed and other" values for "Walls, above grade" and extends from the bottom to the top of all perimeter floor framing or floor assembly members.
2. Insulation applied to the underside of concrete floor slabs shall be permitted an airspace of not more than 1 inch (25 mm) where it turns up and is in contact with the underside of the floor under walls associated with the *building thermal envelope*.

C402.2.4 Slabs-on-grade. The minimum thermal resistance (*R*-value) of the insulation for unheated or heated slab-on-grade floors designed in accordance with the *R*-value method of Section C402.1.3 shall be as specified in Table C402.1.3.

C402.2.4.1 Insulation installation. Where installed, the perimeter insulation shall be placed on the outside of the foundation or on the inside of the foundation wall. The perimeter insulation shall extend downward from the top of the slab for the minimum distance shown in the table or to the top of the footing, whichever is less, or downward to not less than the bottom of the slab and then horizontally to the interior or exterior for the total distance shown in the table. Insulation extending away from the building shall be protected by pavement or by not less than 10 inches (254 mm) of soil. Where installed, full slab insulation shall be continuous under the entire area of the slab-on-grade floor, except at structural column locations and service penetrations. Insulation required at the heated slab

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perimeter shall not be required to extend below the bottom of the heated slab and shall be continuous with the full slab insulation.

Exception: Where the slab-on-grade floor is greater than 24 inches (61 mm) below the finished exterior grade, perimeter insulation is not required.

C402.2.5 Below-grade walls. The *C*-factor for the below-grade exterior walls shall be in accordance with Table C402.1.4. The *R*-value of the insulating material installed continuously within or on the below-grade exterior walls of the building envelope shall be in accordance with Table C402.1.3. The *C*-factor or *R*-value required shall extend to a depth of not less than 10 feet (3048 mm) below the outside finished ground level, or to the level of the lowest floor of the conditioned space enclosed by the below-grade wall, whichever is less.

C402.2.6 Insulation of radiant heating systems. *Radiant heating system* panels, and their associated components that are installed in interior or exterior assemblies, shall be insulated to an *R*-value of not less than R-3.5 on all surfaces not facing the space being heated. *Radiant heating system* panels that are installed in the *building thermal envelope* shall be separated from the exterior of the building or unconditioned or exempt spaces by not less than the *R*-value of insulation installed in the opaque assembly in which they are installed or the assembly shall comply with Section C402.1.4.

Exception: Heated slabs on grade insulated in accordance with Section C402.2.4.

C402.2.7 Airspaces. Where the *R*-value of an airspace is used for compliance in accordance with Section C402.1, the airspace shall be enclosed in an unventilated cavity constructed to minimize airflow into and out of the enclosed airspace. Airflow shall be deemed minimized where the enclosed airspace is located on the interior side of the continuous air barrier and is bounded on all sides by building components.

Exception: The thermal resistance of airspaces located on the exterior side of the continuous air barrier and adjacent to and behind the exterior wall-covering material shall be determined in accordance with ASTM C1363 modified with an airflow entering the bottom and exiting the top of the airspace at an air movement rate of not less than 70 mm/second.

C402.3 Roof solar reflectance and thermal emittance. Low-sloped roofs directly above cooled conditioned spaces in *Climate Zones* 0 through 3 shall comply with one or more of the options in Table C402.3.

Exceptions: The following roofs and portions of roofs are exempt from the requirements of Table C402.3:

1. Portions of the roof that include or are covered by the following:
   1.1. Photovoltaic systems or components.
   1.2. Solar air or water-heating systems or components.
   1.3. Vegetative roofs or landscaped roofs.
   1.4. Above-roof decks or walkways.
   1.5. Skylights.
   1.6. HVAC systems and components, and other opaque objects mounted above the roof.
2. Portions of the roof shaded during the peak sun angle on the summer solstice by permanent features of the building or by permanent features of adjacent buildings.
3. Portions of roofs that are ballasted with a minimum stone ballast of 17 pounds per square foot (74 kg/m^2) or 23 psf (117 kg/m^2) pavers.
4. Roofs where not less than 75 percent of the roof area complies with one or more of the exceptions to this section.

TABLE C402.3
MINIMUM ROOF REFLECTANCE AND EMITTANCE OPTIONS[a]

Three-year-aged solar reflectance[b] of 0.55 and 3-year aged thermal emittance[c] of 0.75
Three-year-aged solar reflectance index[d] of 64

a. The use of area-weighted averages to comply with these requirements shall be permitted. Materials lacking 3-year-aged tested values for either solar reflectance or thermal emittance shall be assigned both a 3-year-aged solar reflectance in accordance with Section C402.3.1 and a 3-year-aged thermal emittance of 0.90.
b. Aged solar reflectance tested in accordance with ASTM C1549, ASTM E903 or ASTM E1918 or CRRC-S100.
c. Aged thermal emittance tested in accordance with ASTM C1371 or ASTM E408 or CRRC-S100.
d. Solar reflectance index (SRI) shall be determined in accordance with ASTM E1980 using a convection coefficient of 2.1 Btu/h × ft^2 × °F (12 W/m^2 × K). Calculation of aged SRI shall be based on aged tested values of solar reflectance and thermal emittance.

C402.3.1 Aged roof solar reflectance. Where an aged solar reflectance required by Section C402.3 is not available, it shall be determined in accordance with Equation 4-3.

$$R_{aged} = [0.2 + 0.7(R_{initial} - 0.2)] \quad \textbf{(Equation 4-3)}$$

where:

R_{aged} = The aged solar reflectance.

$R_{initial}$ = The initial solar reflectance determined in accordance with CRRC-S100.

C402.4 Fenestration. Fenestration shall comply with Sections C402.4.1 through C402.4.5 and Table C402.4. Daylight responsive controls shall comply with this section and Section C405.2.4.

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TABLE C402.4
BUILDING ENVELOPE FENESTRATION MAXIMUM *U*-FACTOR AND SHGC REQUIREMENTS

CLIMATE ZONE	0 AND 1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
Vertical fenestration																
***U*-factor**																
Fixed fenestration	0.50		0.45		0.42		0.36		0.36		0.34		0.29		0.26	
Operable fenestration	0.62		0.60		0.54		0.45		0.45		0.42		0.36		0.32	
Entrance doors	0.83		0.77		0.68		0.63		0.63		0.63		0.63		0.63	
SHGC																
	Fixed	Operable	Fixed	Operable	Fixed	Operable	Fixed	Operable	Fixed	Operable	Fixed	Operable	Fixed	Operable	Fixed	Operable
PF < 0.2	0.23	0.21	0.25	0.23	0.25	0.23	0.36	0.33	0.38	0.33	0.38	0.34	0.40	0.36	0.40	0.36
0.2 ≤ PF < 0.5	0.28	0.25	0.30	0.28	0.30	0.28	0.43	0.40	0.46	0.40	0.46	0.41	0.48	0.43	0.48	0.43
PF ≥ 0.5	0.37	0.34	0.40	0.37	0.40	0.37	0.58	0.53	0.61	0.53	0.61	0.54	0.64	0.58	0.64	0.58
Skylights																
U-factor	0.70		0.65		0.55		0.50		0.50		0.50		0.44		0.41	
SHGC	0.30		0.30		0.30		0.40		0.40		0.40		NR		NR	

NR = No Requirement, PF = Projection Factor.

C402.4.1 Maximum area. The vertical fenestration area, not including opaque doors and opaque spandrel panels, shall be not greater than 30 percent of the gross above-grade wall area. The skylight area shall be not greater than 3 percent of the gross roof area.

C402.4.1.1 Increased vertical fenestration area with daylight responsive controls. In *Climate Zones* 0 through 6, not more than 40 percent of the gross above-grade wall area shall be vertical fenestration, provided that all of the following requirements are met:

1. In buildings not greater than two stories above grade, not less than 50 percent of the net floor area is within a *daylight zone*.
2. In buildings three or more stories above grade, not less than 25 percent of the net floor area is within a *daylight zone*.
3. *Daylight responsive controls* are installed in *daylight zones*.
4. Visible transmittance (VT) of vertical fenestration is not less than 1.1 times solar heat gain coefficient (SHGC).

   Exception: Fenestration that is outside the scope of NFRC 200 is not required to comply with Item 4.

C402.4.1.2 Increased skylight area with daylight responsive controls. The skylight area shall be not more than 6 percent of the roof area provided that *daylight responsive controls* are installed in *toplit daylight zones*.

C402.4.2 Minimum skylight fenestration area. Skylights shall be provided in enclosed spaces greater than 2,500 square feet (232 m^2) in floor area, directly under a roof with not less than 75 percent of the ceiling area with a ceiling height greater than 15 feet (4572 mm), and used as an office, lobby, atrium, concourse, corridor, storage space, gymnasium/exercise center, convention center, automotive service area, space where manufacturing occurs, nonrefrigerated warehouse, retail store, distribution/sorting area, transportation depot or workshop. The total *toplit daylight zone* shall be not less than half the floor area and shall comply with one of the following:

1. A minimum skylight area to *toplit daylight zone* of not less than 3 percent where all skylights have a VT of not less than 0.40, or VT_{annual} of not less than 0.26, as determined in accordance with Section C303.1.3.
2. A minimum skylight effective aperture, determined in accordance with Equation 4-4, of:
   2.1. Not less than 1 percent using a skylight's VT rating; or
   2.2. Not less than 0.66 percent using a Tubular Daylight Device's VT_{annual} rating.

$$\text{Skylight Effective Aperture} = \frac{0.85 \times \text{Skylight Area} \times \text{Skylight VT} \times \text{WF}}{\text{Toplit Zone}}$$

(Equation 4-4)

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where:

Skylight area = Total fenestration area of skylights.

Skylight VT = Area weighted average visible transmittance of skylights.

WF = Area weighted average well factor, where well factor is 0.9 if light well depth is less than 2 feet (610 mm), or 0.7 if light well depth is 2 feet (610 mm) or greater, or 1.0 for Tubular Daylighting Devices with VT_{annual} ratings.

Light well depth = Measure vertically from the underside of the lowest point of the skylight glazing to the ceiling plane under the skylight.

Exception: Skylights above *daylight zones* of enclosed spaces are not required in:

1. Buildings in *Climate Zones* 6 through 8.
2. Spaces where the designed *general lighting* power densities are less than 0.5 W/ft^2 (5.4 W/m^2).
3. Areas where it is documented that existing structures or natural objects block direct beam sunlight on not less than half of the roof over the enclosed area for more than 1,500 daytime hours per year between 8 a.m. and 4 p.m.
4. Spaces where the *daylight zone* under rooftop monitors is greater than 50 percent of the enclosed space floor area.
5. Spaces where the total area minus the area of *sidelit daylight zones* is less than 2,500 square feet (232 m^2), and where the lighting is controlled in accordance with Section C405.2.3.
6. Spaces designed as storm shelters complying with ICC 500.

C402.4.2.1 Lighting controls in toplit daylight zones. *Daylight responsive controls* shall be provided in toplit daylight zones.

C402.4.2.2 Haze factor. Skylights in office, storage, automotive service, manufacturing, nonrefrigerated warehouse, retail store and distribution/sorting area spaces shall have a glazing material or diffuser with a haze factor greater than 90 percent when tested in accordance with ASTM D1003.

Exception: Skylights and tubular daylighting devices designed and installed to exclude direct sunlight entering the occupied space by the use of fixed or automated baffles, the geometry of skylight and light well or the use of optical diffuser components.

C402.4.3 Maximum *U*-factor and SHGC. The maximum *U*-factor and solar heat gain coefficient (SHGC) for fenestration shall be as specified in Table C402.4.

The window projection factor shall be determined in accordance with Equation 4-5.

$$PF = A/B \qquad \textbf{(Equation 4-5)}$$

where:

PF = Projection factor (decimal).

A = Distance measured horizontally from the farthest continuous extremity of any overhang, eave or permanently attached shading device to the vertical surface of the glazing.

B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave or permanently attached shading device.

Where different windows or glass doors have different *PF* values, they shall each be evaluated separately.

C402.4.3.1 Increased skylight SHGC. In *Climate Zones* 0 through 6, skylights shall be permitted a maximum SHGC of 0.60 where located above *daylight zones* provided with *daylight responsive controls*.

C402.4.3.2 Increased skylight *U*-factor. Where skylights are installed above *daylight zones* provided with *daylight responsive controls*, a maximum *U*-factor of 0.9 shall be permitted in *Climate Zones* 0 through 3 and a maximum *U*-factor of 0.75 shall be permitted in *Climate Zones* 4 through 8.

C402.4.3.3 Dynamic glazing. Where dynamic glazing is intended to satisfy the SHGC and VT requirements of Table C402.4, the ratio of the higher to lower labeled SHGC shall be greater than or equal to 2.4, and the *dynamic glazing* shall be automatically controlled to modulate the amount of solar gain into the space in multiple steps. Dynamic glazing shall be considered separately from other fenestration, and area-weighted averaging with other fenestration that is not dynamic glazing shall not be permitted.

Exception: Dynamic glazing is not required to comply with this section where both the lower and higher labeled SHGC already comply with the requirements of Table C402.4.

C402.4.3.4 Area-weighted *U*-factor. An area-weighted average shall be permitted to satisfy the *U*-factor requirements for each fenestration product category listed in Table C402.4. Individual fenestration products from different fenestration product categories listed in Table C402.4 shall not be combined in calculating area-weighted average *U*-factor.

C402.4.4 Daylight zones. Daylight zones referenced in Sections C402.4.1.1 through C402.4.3.2 shall comply with Sections C405.2.4.2 and C405.2.4.3, as applicable.

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Daylight zones shall include *toplit daylight zones* and sidelit *daylight* zones.

C402.4.5 Doors. Opaque swinging doors shall comply with Table C402.1.4. Opaque nonswinging doors shall comply with Table C402.1.4. Opaque doors shall be considered as part of the gross area of above-grade walls that are part of the *building thermal envelope*. Opaque doors shall comply with Section C402.4.5.1 or C402.4.5.2. Other doors shall comply with the provisions of Section C402.4.3 for vertical fenestration.

C402.4.5.1 Opaque swinging doors. Opaque swinging doors shall comply with Table C402.1.4.

C402.4.5.2 Nonswinging doors. Opaque nonswinging doors that are horizontally hinged sectional doors with a single row of fenestration shall have an assembly *U*-factor less than or equal to 0.440 in Climate Zones 0 through 6 and less than or equal to 0.360 in Climate Zones 7 and 8, provided that the fenestration area is not less than 14 percent and not more than 25 percent of the total door area.

Exception: Other doors shall comply with the provisions of Section C402.4.3 for vertical fenestration.

C402.5 Air leakage—thermal envelope. The *building thermal envelope* shall comply with Sections C402.5.1 through Section C402.5.11.1, or the building *thermal envelope* shall be tested in accordance with Section C402.5.2 or C402.5.3. Where compliance is based on such testing, the building shall also comply with Sections C402.5.7, C402.5.8 and C402.5.9.

C402.5.1 Air barriers. A continuous air barrier shall be provided throughout the *building thermal envelope*. The continuous air barriers shall be located on the inside or outside of the building thermal envelope, located within the assemblies composing the building thermal envelope, or any combination thereof. The air barrier shall comply with Sections C402.5.1.1, and C402.5.1.2.

Exception: Air barriers are not required in buildings located in *Climate Zone* 2B.

C402.5.1.1 Air barrier construction. The *continuous air barrier* shall be constructed to comply with the following:

1. The air barrier shall be continuous for all assemblies that are the thermal envelope of the building and across the joints and assemblies.
2. Air barrier joints and seams shall be sealed, including sealing transitions in places and changes in materials. The joints and seals shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation.
3. Penetrations of the air barrier shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location. Sealing shall allow for expansion, contraction and mechanical vibration. Joints and seams associated with penetrations shall be sealed in the same manner or taped. Sealing materials shall be securely installed around the penetration so as not to dislodge, loosen or otherwise impair the penetrations' ability to resist positive and negative pressure from wind, stack effect and mechanical ventilation. Sealing of concealed fire sprinklers, where required, shall be in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.
4. Recessed lighting fixtures shall comply with Section C402.5.10. Where similar objects are installed that penetrate the air barrier, provisions shall be made to maintain the integrity of the air barrier.

C402.5.1.2 Air barrier compliance. A continuous air barrier for the opaque building envelope shall comply with the following:

1. Buildings or portions of buildings, including Group R and I occupancies, shall meet the provisions of Section C402.5.2.

   Exception: Buildings in Climate Zones 2B, 3C and 5C.

2. Buildings or portions of buildings other than Group R and I occupancies shall meet the provisions of Section C402.5.3.

   Exceptions:

   1. Buildings in Climate Zones 2B, 3B, 3C and 5C.
   2. Buildings larger than 5,000 square feet (464.5 m^2) floor area in Climate Zones 0B, 1, 2A, 4B and 4C.
   3. Buildings between 5,000 square feet (464.5 m^2) and 50,000 square feet (4645 m^2) floor area in Climate Zones 0A, 3A and 5B.

3. Buildings or portions of buildings that do not complete air barrier testing shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5.

C402.5.1.3 Materials. Materials with an air permeability not greater than 0.004 cfm/ft^2 (0.02 L/s × m^2) under a pressure differential of 0.3 inch water gauge (75 Pa) when tested in accordance with ASTM E2178 shall comply with this section. Materials in Items 1 through 16 shall be deemed to comply with this section, provided that joints are sealed and materials

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are installed as air barriers in accordance with the manufacturer's instructions.

1. Plywood with a thickness of not less than $^3/_8$ inch (10 mm).
2. Oriented strand board having a thickness of not less than $^3/_8$ inch (10 mm).
3. Extruded polystyrene insulation board having a thickness of not less than $^1/_2$ inch (12.7 mm).
4. Foil-back polyisocyanurate insulation board having a thickness of not less than $^1/_2$ inch (12.7 mm).
5. Closed-cell spray foam having a minimum density of 1.5 pcf (2.4 kg/m^3) and having a thickness of not less than $1^1/_2$ inches (38 mm).
6. Open-cell spray foam with a density between 0.4 and 1.5 pcf (0.6 and 2.4 kg/m^3) and having a thickness of not less than 4.5 inches (113 mm).
7. Exterior or interior gypsum board having a thickness of not less than $^1/_2$ inch (12.7 mm).
8. Cement board having a thickness of not less than $^1/_2$ inch (12.7 mm).
9. Built-up roofing membrane.
10. Modified bituminous roof membrane.
11. Single-ply roof membrane.
12. A Portland cement/sand parge, or gypsum plaster having a thickness of not less than $^5/_8$ inch (15.9 mm).
13. Cast-in-place and precast concrete.
14. Fully grouted concrete block masonry.
15. Sheet steel or aluminum.
16. Solid or hollow masonry constructed of clay or shale masonry units.

C402.5.1.4 Assemblies. Assemblies of materials and components with an average air leakage not greater than 0.04 cfm/ft^2 (0.2 L/s × m^2) under a pressure differential of 0.3 inch of water gauge (w.g.)(75 Pa) when tested in accordance with ASTM E2357, ASTM E1677, ASTM D8052 or ASTM E283 shall comply with this section. Assemblies listed in Items 1 through 3 shall be deemed to comply, provided that joints are sealed and the requirements of Section C402.5.1.1 are met.

1. Concrete masonry walls coated with either one application of block filler or two applications of a paint or sealer coating.
2. Masonry walls constructed of clay or shale masonry units with a nominal width of 4 inches (102 mm) or more.
3. A Portland cement/sand parge, stucco or plaster not less than $^1/_2$ inch (12.7 mm) in thickness.

C402.5.1.5 Building envelope performance verification. The installation of the continuous air barrier shall be verified by the *code official*, a *registered design professional* or *approved* agency in accordance with the following:

1. A review of the construction documents and other supporting data shall be conducted to assess compliance with the requirements in Section C402.5.1.
2. Inspection of continuous air barrier components and assemblies shall be conducted during construction while the air barrier is still accessible for inspection and repair to verify compliance with the requirements of Sections C402.5.1.3 and C402.5.1.4.
3. A final commissioning report shall be provided for inspections completed by the *registered design professional* or *approved* agency. The commissioning report shall be provided to the building owner or owner's authorized agent and the *code official*. The report shall identify deficiencies found during the review of the construction documents and inspection and details of corrective measures taken.

C402.5.2 Dwelling and sleeping unit enclosure testing. The *building thermal envelope* shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E1827 or an equivalent method approved by the *code official*. The measured air leakage shall not exceed 0.30 cfm/ft^2 (1.5 L/s m^2) of the testing unit enclosure area at a pressure differential of 0.2 inch water gauge (50 Pa). Where multiple dwelling units or sleeping units or other occupiable conditioned spaces are contained within one *building thermal envelope*, each unit shall be considered an individual testing unit, and the building air leakage shall be the weighted average of all testing unit results, weighted by each testing unit's enclosure area. Units shall be tested separately with an unguarded blower door test as follows:

1. Where buildings have fewer than eight testing units, each testing unit shall be tested.
2. For buildings with eight or more testing units, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit and a unit with the largest testing unit enclosure area. For each tested unit that exceeds the maximum air leakage rate, an additional two units shall be tested, including a mixture of testing unit types and locations.

C402.5.3 Building thermal envelope testing. The *building thermal envelope* shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E3158 or ASTM E1827 or an equivalent method approved by the

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code official. The measured air leakage shall not exceed 0.40 cfm/ft^2 (2.0 L/s × m^2) of the *building thermal envelope* area at a pressure differential of 0.3 inch water gauge (75 Pa). Alternatively, portions of the building shall be tested and the measured air leakages shall be area weighted by the surface areas of the building envelope in each portion. The weighted average test results shall not exceed the whole building leakage limit. In the alternative approach, the following portions of the building shall be tested:

1. The entire envelope area of all stories that have any spaces directly under a roof.
2. The entire envelope area of all stories that have a building entrance, exposed floor, or loading dock, or are below grade.
3. Representative above-grade sections of the building totaling at least 25 percent of the wall area enclosing the remaining conditioned space.

Exception: Where the measured air leakage rate exceeds 0.40 cfm/ft^2 (2.0 L/s × m^2) but does not exceed 0.60 cfm/ft^2 (3.0 L/s × m^2), a diagnostic evaluation using smoke tracer or infrared imaging shall be conducted while the building is pressurized along with a visual inspection of the air barrier. Any leaks noted shall be sealed where such sealing can be made without destruction of existing building components. An additional report identifying the corrective actions taken to seal leaks shall be submitted to the code official and the building owner, and shall be deemed to comply with the requirements of this section.

C402.5.4 Air leakage of fenestration. The air leakage of fenestration assemblies shall meet the provisions of Table C402.5.4. Testing shall be in accordance with the applicable reference test standard in Table C402.5.4 by an accredited, independent testing laboratory and *labeled* by the manufacturer.

Exceptions:

1. Field-fabricated fenestration assemblies that are sealed in accordance with Section C402.5.1.
2. Fenestration in buildings that comply with the testing alternative of Section C402.5 are not required to meet the air leakage requirements in Table C402.5.4.

C402.5.5 Rooms containing fuel-burning appliances. In *Climate Zones* 3 through 8, where combustion air is supplied through openings in an exterior wall to a room or space containing a space-conditioning fuel-burning appliance, one of the following shall apply:

1. The room or space containing the appliance shall be located outside of the *building thermal envelope*.
2. The room or space containing the appliance shall be enclosed and isolated from conditioned spaces inside the *building thermal envelope*. Such rooms shall comply with all of the following:
   2.1. The walls, floors and ceilings that separate the enclosed room or space from conditioned spaces shall be insulated to be not less than equivalent to the insulation requirement of below-grade walls as specified in Table C402.1.3 or Table C402.1.4.
   2.2. The walls, floors and ceilings that separate the enclosed room or space from conditioned spaces shall be sealed in accordance with Section C402.5.1.1.

TABLE C402.5.4
MAXIMUM AIR LEAKAGE RATE FOR FENESTRATION ASSEMBLIES

FENESTRATION ASSEMBLY	MAXIMUM RATE (CFM/FT^2)	TEST PROCEDURE
Windows	0.20[a]	AAMA/WDMA/CSA101/I.S.2/A440 or NFRC 400
Sliding doors	0.20[a]	
Swinging doors	0.20[a]	
Skylights—with condensation weepage openings	0.30	
Skylights—all other	0.20[a]	
Curtain walls	0.06	NFRC 400 or ASTM E283 at 1.57 psf (75 Pa)
Storefront glazing	0.06	
Commercial glazed swinging entrance doors	1.00	
Power-operated sliding doors and power operated folding doors	1.00	
Revolving doors	1.00	
Garage doors	0.40	ANSI/DASMA 105, NFRC 400, or ASTM E283 at 1.57 psf (75 Pa)
Rolling doors	1.00	
High-speed doors	1.30	

For SI: 1 cubic foot per minute = 0.47 L/s, 1 square foot = 0.093 m^2.

a. The maximum rate for windows, sliding and swinging doors, and skylights is permitted to be 0.3 cfm per square foot of fenestration or door area when tested in accordance with AAMA/WDMA/CSA101/I.S.2/A440 at 6.24 psf (300 Pa).

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2.3. The doors into the enclosed room or space shall be fully gasketed.

2.4. Water lines and ducts in the enclosed room or space shall be insulated in accordance with Section C403.

2.5. Where an air duct supplying combustion air to the enclosed room or space passes through *conditioned space*, the duct shall be insulated to an *R*-value of not less than R-8.

Exception: Fireplaces and stoves complying with Sections 901 through 905 of the *International Mechanical Code*, and Section 2111.14 of the *International Building Code*.

C402.5.6 Doors and access openings to shafts, chutes, stairways and elevator lobbies. Doors and *access* openings from conditioned space to shafts, chutes stairways and elevator lobbies not within the scope of the fenestration assemblies covered by Section C402.5.4 shall be gasketed, weather-stripped or sealed.

Exceptions:

1. Door openings required to comply with Section 716 of the *International Building Code*.
2. Doors and door openings required to comply with UL 1784 by the *International Building Code*.

C402.5.7 Air intakes, exhaust openings, stairways and shafts. Stairway enclosures, elevator shaft vents and other outdoor air intakes and exhaust openings integral to the building envelope shall be provided with dampers in accordance with Section C403.7.7.

C402.5.8 Loading dock weather seals. Cargo door openings and loading door openings shall be equipped with weather seals that restrict infiltration and provide direct contact along the top and sides of vehicles that are parked in the doorway.

C402.5.9 Vestibules. Building entrances shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time. The installation of one or more revolving doors in the *building entrance* shall not eliminate the requirement that a vestibule be provided on any doors adjacent to revolving doors.

Exceptions: Vestibules are not required for the following:

1. Buildings in *Climate Zones* 0 through 2.
2. Doors not intended to be used by the public, such as doors to mechanical or electrical equipment rooms, or intended solely for employee use.
3. Doors opening directly from a *sleeping unit* or dwelling unit.
4. Doors that open directly from a space less than 3,000 square feet (298 m^2) in area.
5. Revolving doors.
6. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.
7. Doors that have an air curtain with a velocity of not less than 6.56 feet per second (2 m/s) at the floor that have been tested in accordance with ANSI/AMCA 220 and installed in accordance with the manufacturer's instructions. Manual or automatic controls shall be provided that will operate the air curtain with the opening and closing of the door. Air curtains and their controls shall comply with Section C408.2.3.

C402.5.10 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be all of the following:

1. IC-rated.
2. Labeled as having an air leakage rate of not more 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E283 at a 1.57 psf (75 Pa) pressure differential.
3. Sealed with a gasket or caulk between the housing and interior wall or ceiling covering.

C402.5.11 Operable openings interlocking. Where occupancies utilize operable openings to the outdoors that are larger than 40 square feet (3.7 m^2) in area, such openings shall be interlocked with the heating and cooling system so as to raise the cooling setpoint to 90°F (32°C) and lower the heating setpoint to 55°F (13°C) whenever the operable opening is open. The change in heating and cooling setpoints shall occur within 10 minutes of opening the operable opening.

Exceptions:

1. Separately zoned areas associated with the preparation of food that contain appliances that contribute to the HVAC loads of a restaurant or similar type of occupancy.
2. Warehouses that utilize overhead doors for the function of the occupancy, where approved by the code official.
3. The first entrance doors where located in the exterior wall and are part of a vestibule system.

C402.5.11.1 Operable controls. Controls shall comply with Section C403.14.

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SECTION C403
BUILDING MECHANICAL SYSTEMS

C403.1 General. Mechanical systems and equipment serving the building heating, cooling, ventilating or refrigerating needs shall comply with this section.

Exception: Data center systems are exempt from the requirements of Sections C403.4 and C403.5.

C403.1.1 Calculation of heating and cooling loads. Design loads associated with heating, ventilating and air conditioning of the building shall be determined in accordance with ANSI/ASHRAE/ACCA Standard 183 or by an *approved* equivalent computational procedure using the design parameters specified in Chapter 3. Heating and cooling loads shall be adjusted to account for load reductions that are achieved where energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE HVAC Systems and Equipment Handbook by an approved equivalent computational procedure.

C403.1.2 Data centers. Data center systems shall comply with Sections 6 and 8 of ASHRAE 90.4 with the following changes:

1. Replace design mechanical load component (MLC) values specified in Table 6.2.1.1 of the ASHRAE 90.4 with the values in Table C403.1.2(1) as applicable in each climate zone.
2. Replace annualized MLC values specified in Table 6.2.1.2 of the ASHRAE 90.4 with the values in Table C403.1.2(2) as applicable in each climate zone.

TABLE C403.1.2(1)
MAXIMUM DESIGN MECHANICAL LOAD COMPONENT (DESIGN MLC)

CLIMATE ZONE	DESIGN MLC AT 100% AND AT 50% ITE LOAD
0A	0.24
OB	0.26
1A	0.23
2A	0.24
3A	0.23
4A	0.23
5A	0.22
6A	0.22
1B	0.28
2B	0.27
3B	0.26
4B	0.23
5B	0.23
6B	0.21
3C	0.19
4C	0.21
5C	0.19
7	0.20
8	0.19

TABLE C403.1.2(2)
MAXIMUM ANNUALIZED MECHANICAL LOAD COMPONENT (ANNUALIZED MLC)

CLIMATE ZONE	HVAC MAXIMUM ANNUALIZED MLC AT 100% AND AT 50% ITE LOAD
0A	0.19
0B	0.20
1A	0.18
2A	0.19
3A	0.18
4A	0.17
5A	0.17
6A	0.17
1B	0.16
2B	0.18
3B	0.18
4B	0.18
5B	0.16
6B	0.17
3C	0.16
4C	0.16
5C	0.16
7	0.16
8	0.16

C403.2 System design. Mechanical systems shall be designed to comply with Sections C403.2.1 through C403.2.3. Where elements of a building's mechanical systems are addressed in Sections C403.3 through C403.14, such elements shall comply with the applicable provisions of those sections.

C403.2.1 Zone isolation required. HVAC systems serving *zones* that are over 25,000 square feet (2323 m^2) in floor area or that span more than one floor and are designed to operate or be occupied nonsimultaneously shall be divided into isolation areas. Each isolation area shall be equipped with *isolation devices* and controls configured to automatically shut off the supply of conditioned air and outdoor air to and exhaust air from the isolation area. Each isolation area shall be controlled independently by a device meeting the requirements of Section C403.4.2.2. Central systems and plants shall be provided with controls and devices that will allow system and equipment operation for any length of time while serving only the smallest isolation area served by the system or plant.

Exceptions:

1. Exhaust air and outdoor air connections to isolation areas where the fan system to which they connect is not greater than 5,000 cfm (2360 L/s).

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2. Exhaust airflow from a single isolation area of less than 10 percent of the design airflow of the exhaust system to which it connects.
3. Isolation areas intended to operate continuously or intended to be inoperative only when all other isolation areas in a *zone* are inoperative.

C403.2.2 Ventilation. Ventilation, either natural or mechanical, shall be provided in accordance with Chapter 4 of the *International Mechanical Code*. Where mechanical ventilation is provided, the system shall provide the capability to reduce the outdoor air supply to the minimum required by Chapter 4 of the *International Mechanical Code*.

C403.2.3 Fault detection and diagnostics. New buildings with an HVAC system serving a gross conditioned floor area of 100,000 square feet (9290 m^2) or larger shall include a fault detection and diagnostics (FDD) system to monitor the HVAC system's performance and automatically identify faults. The FDD system shall:

1. Include permanently installed sensors and devices to monitor the HVAC system's performance.
2. Sample the HVAC system's performance at least once every 15 minutes.
3. Automatically identify and report HVAC system faults.
4. Automatically notify authorized personnel of identified HVAC system faults.
5. Automatically provide prioritized recommendations for repair of identified faults based on analysis of data collected from the sampling of HVAC system performance.
6. Be capable of transmitting the prioritized fault repair recommendations to remotely located authorized personnel.

Exception: R-1 and R-2 occupancies.

C403.3 Heating and cooling equipment efficiencies. Heating and cooling equipment installed in mechanical systems shall be sized in accordance with Section C403.3.1 and shall be not less efficient in the use of energy than as specified in Section C403.3.2.

C403.3.1 Equipment sizing. The output capacity of heating and cooling equipment shall be not greater than that of the smallest available equipment size that exceeds the loads calculated in accordance with Section C403.1.1. A single piece of equipment providing both heating and cooling shall satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.

Exceptions:

1. Required standby equipment and systems provided with controls and devices that allow such systems or equipment to operate automatically only when the primary equipment is not operating.
2. Multiple units of the same equipment type with combined capacities exceeding the design load and provided with controls that are configured to sequence the operation of each unit based on load.

C403.3.2 HVAC equipment performance requirements. Equipment shall meet the minimum efficiency requirements of Tables C403.3.2(1) through C403.3.2(16) when tested and rated in accordance with the applicable test procedure. Plate-type liquid-to-liquid heat exchangers shall meet the minimum requirements of AHRI 400. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein.

C403.3.2.1 Water-cooled centrifugal chilling packages. Equipment not designed for operation at AHRI Standard 550/590 test conditions of 44.00°F leaving and 54.00°F entering chilled-fluid temperatures, and with 85.00°F entering and 94.30°F leaving condenser-fluid temperatures, shall have maximum full-load kW/ton (FL) and part-load rating requirements adjusted using the following equations:

$$FL_{adj} = FL/K_{adj} \quad \textbf{(Equation 4-6)}$$

$$PLV_{adj} = IPLV.IP/K_{adj} \quad \textbf{(Equation 4-7)}$$

where:

K_{adj} = $A \times B$

FL = Full-load kW/ton value from Table C403.3.2(3).

FL_{adj} = Maximum full-load kW/ton rating, adjusted for nonstandard conditions.

$IPLV.IP$ = $IPLV.IP$ value from Table C403.3.2(3).

PLV_{adj} = Maximum $NPLV$ rating, adjusted for nonstandard conditions.

A = $0.00000014592 \times (LIFT)^4 - 0.0000346496 \times (LIFT)^3 + 0.00314196 \times (LIFT)^2 - 0.147199 \times (LIFT) + 3.93073$

B = $0.0015 \times L_{vg}E_{vap} + 0.934$

$LIFT$ = $L_{vg}Cond - L_{vg}E_{vap}$

$L_{vg}Cond$ = Full-load condenser leaving fluid temperature (°F).

$L_{vg}E_{vap}$ = Full-load evaporator leaving temperature (°F).

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The FL_{adj} and PLV_{adj} values are applicable only for centrifugal chillers meeting all of the following full-load design ranges:

- $36.00°F \leq L_{vg}E_{vap} \leq 60.00°F$
- $L_{vg}Cond \leq 115.00°F$
- $20.00°F \leq LIFT \leq 80.00°F$

Manufacturers shall calculate the FL_{adj} and PLV_{adj} before determining whether to label the chiller. Centrifugal chillers designed to operate outside of these ranges are not covered by this code.

C403.3.2.2 Positive displacement (air- and water-cooled) chilling packages. Equipment with a leaving fluid temperature higher than 32°F (0°C) and water-cooled positive displacement chilling packages with a condenser leaving fluid temperature below 115°F (46°C) shall meet the requirements of the tables in Section C403.3.2 when tested or certified with water at standard rating conditions, in accordance with the referenced test procedure.

C403.3.3 Hot gas bypass limitation. Cooling systems shall not use hot gas bypass or other evaporator pressure control systems unless the system is designed with multiple steps of unloading or continuous capacity modulation. The capacity of the hot gas bypass shall be limited as indicated in Table C403.3.3, as limited by Section C403.5.1.

TABLE C403.3.2(1)
ELECTRICALLY OPERATED UNITARY AIR CONDITIONERS AND CONDENSING UNITS—MINIMUM EFFICIENCY REQUIREMENTS[c, d]

EQUIPMENT TYPE	SIZE CATEGORY	HEADING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air conditioners, air cooled	< 65,000 Btu/h[b]	All	Split system, three phase and applications outside US single phase[b]	13.0 SEER before 1/1/2023 13.4 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single-package, three phase and applications outside US single phase[b]	14.0 SEER before 1/1/2023 13.4 SEER2 after 1/1/2023	
Space constrained, air cooled	≤ 30,000 Btu/h[b]	All	Split system, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 11.7 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single package, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 11.7 SEER2 after 1/1/2023	
Small duct, high velocity, air cooled	< 65,000 Btu/h[b]	All	Split system, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 12.1 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
Air conditioners, air cooled	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)	Split system and single package	11.2 EER 12.9 IEER before 1/1/2023 14.8 IEER after 1/1/2023	AHRI 340/360
		All other		11.0 EER 12.7 IEER before 1/1/2023 14.6 IEER after 1/1/2023	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric resistance (or none)		11.0 EER 12.4 IEER before 1/1/2023 14.2 IEER after 1/1/2023	
		All other		10.8 EER 12.2 IEER before 1/1/2023 14.0 IEER after 1/1/2023	

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TABLE C403.3.2(1)—continued
ELECTRICALLY OPERATED UNITARY AIR CONDITIONERS AND CONDENSING UNITS—MINIMUM EFFICIENCY REQUIREMENTS[c, d]

EQUIPMENT TYPE	SIZE CATEGORY	HEADING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air conditioners, air cooled *(continued)*	≥ 240,000 Btu/h and < 760,000 Btu/h	Electric resistance (or none)	Split system and single package	10.0 EER 11.6 IEER before 1/1/2023 13.2 IEER after 1/1/2023	AHRI 340/360
		All other		9.8 EER 11.4 IEER before 1/1/2023 13.0 IEER after 1/1/2023	
	≥ 760,000 Btu/h	Electric resistance (or none)		9.7 EER 11.2 IEER before 1/1/2023 12.5 IEER after 1/1/2023	
		All other		9.5 EER 11.0 IEER before 1/1/2023 12.3 IEER after 1/1/2023	
Air conditioners, water cooled	< 65,000 Btu/h	All	Split system and single package	12.1 EER 12.3 IEER	AHRI 210/240
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)		12.1 EER 13.9 IEER	AHRI 340/360
		All other		11.9 EER 13.7 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric resistance (or none)		12.5 EER 13.9 IEER	
		All other		12.3 EER 13.7 IEER	
	≥ 240,000 Btu/h and < 760,000 Btu/h	Electric resistance (or none)		12.4 EER 13.6 IEER	
		All other		12.2 EER 13.4 IEER	
	≥ 760,000 Btu/h	Electric resistance (or none)		12.2 EER 13.5 IEER	
		All other		12.0 EER 13.3 IEER	

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TABLE C403.3.2(1)—continued
ELECTRICALLY OPERATED UNITARY AIR CONDITIONERS AND CONDENSING UNITS—MINIMUM EFFICIENCY REQUIREMENTS[c, d]

EQUIPMENT TYPE	SIZE CATEGORY	HEADING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air conditioners, evaporatively cooled	< 65,000 Btu/h[b]	All	Split system and single package	12.1 EER 12.3 IEER	AHRI 210/240
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)		12.1 EER 12.3 IEER	AHRI 340/360
		All other		11.9 EER 12.1 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric resistance (or none)		12.0 EER 12.2 IEER	
		All other		11.8 EER 12.0 IEER	
	≥ 240,000 Btu/h and < 760,000 Btu/h	Electric resistance (or none)		11.9 EER 12.1 IEER	
		All other		11.7 EER 11.9 IEER	
	≥ 760,000 Btu/h	Electric resistance (or none)		11.7 EER 11.9 IEER	
		All other		11.5 EER 11.7 IEER	
Condensing units, air cooled	≥ 135,000 Btu/h	—	—	10.5 EER 11.8 IEER	AHRI 365
Condensing units, water cooled	≥ 135,000 Btu/h	—	—	13.5 EER 14.0 IEER	AHRI 365
Condensing units, evaporatively cooled	≥ 135,000 Btu/h	—	—	13.5 EER 14.0 IEER	AHRI 365

For SI: 1 British thermal unit per hour = 0.2931 W.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Single-phase, US air-cooled air conditioners less than 65,000 Btu/h are regulated as consumer products by the US Department of Energy Code of Federal Regulations DOE 10 CFR 430. SEER and SEER2 values for single-phase products are set by the US Department of Energy.

c. DOE 10 CFR 430 Subpart B Appendix M1 includes the test procedure updates effective 1/1/2023 that will be incorporated in AHRI 210/240—2023.

d. This table is a replica of ASHRAE 90.1 Table 6.8.1-1 Electrically Operated Unitary Air Conditioners and Condensing Units—Minimum Efficiency Requirements.

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TABLE C403.3.2(2)
ELECTRICALLY OPERATED AIR-COOLED UNITARY HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[c, d]

EQUIPMENT TYPE	SIZE CATEGORY	HEADING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air cooled (cooling mode)	< 66,000 Btu/h	All	Split system, three phase and applications outside US single phase[b]	14.0 SEER before 1/1/2023 14.3 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single package, three phase and applications outside US single phase[b]	14.0 SEER before 1/1/2023 13.4 SEER2 after 1/1/2023	
Space constrained, air cooled (cooling mode)	≤ 30,000 Btu/h	All	Split system, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 11.7 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single package, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 11.7 SEER2 after 1/1/2023	
Single duct, high velocity, air cooled (cooling mode)	< 65,000	All	Split system, three phase and applications outside US single phase[b]	12.0 SEER before 1/1/2023 12.0 SEER2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
Air cooled (cooling mode)	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)	Split system and single package	11.0 EER 12.2 IEER before 1/1/2023 14.1 IEER after 1/1/2023	AHRI 340/360
		All other		10.8 EER 12.0 IEER before 1/1/2023 13.9 IEER after 1/1/2023	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric resistance (or none)		10.6 EER 11.6 IEER before 1/1/2023 13.5 IEER after 1/1/2023	
		All other		10.4 EER 11.4 IEER before 1/1/2023 13.3 IEER after 1/1/2023	
	≥ 240,000 Btu/h	Electric resistance (or none)		9.5 EER 10.6 IEER before 1/1/2023 12.5 IEER after 1/1/2023	
		All other		9.3 EER 10.4 IEER before 1/1/2023 12.3 IEER after 1/1/2023	
Air cooled (heating mode)	< 65,000 Btu/h	All	Split system, three phase and applications outside US single phase[b]	8.2 HSPF before 1/1/2023 7.5 HSPF2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single package, three phase and applications outside US single phase[b]	8.0 HSPF before 1/1/2023 6.7 HSPF2 after 1/1/2023	

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TABLE C403.3.2(2)—continued
ELECTRICALLY OPERATED AIR-COOLED UNITARY HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[c, d]

EQUIPMENT TYPE	SIZE CATEGORY	HEADING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Space constrained, air cooled (heating mode)	≤ 30,000 Btu/h	All	Split system, three phase and applications outside US single phase[b]	7.4 HSPF before 1/1/2023 6.3 HSPF2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
			Single package, three phase and applications outside US single phase[b]	7.4 HSPF before 1/1/2023 6.3 HSPF2 after 1/1/2023	
Small duct, high velocity, air cooled (heating mode)	< 65,000 Btu/h	All	Split system, three phase and applications outside US single phase[b]	7.2 HSPF before 1/1/2023 6.1 HSPF2 after 1/1/2023	AHRI 210/240—2017 before 1/1/2023 AHRI 210/240—2023 after 1/1/2023
Air cooled (heating mode)	≥ 65,000 Btu/h and < 135,000 Btu/h (cooling capacity)	All	47°F db/43°F wb outdoor air	3.30 COP_H before 1/1/2023 3.40 COP_H after 1/1/2023	AHRI 340/360
			17°F db/15°F wb outdoor air	2.25 COP_H	
	≥ 135,000 Btu/h and < 240,000 Btu/h (cooling capacity)		47°F db/43°F wb outdoor air	3.20 COP_H before 1/1/2023 3.30 SOP_H after 1/1/2023	
			17°F db/15°F wb outdoor air	2.05 COP_H	
	≥ 240,000 Btu/h (cooling capacity)		47°F db/43°F wb outdoor air	3.20 COP_H	
			17°F db/15°F wb outdoor air	2.05 COP_H	

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) – 32]/1.8, wb = wet bulb, db = dry bulb.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Single-phase, US air-cooled heat pumps less than 65,000 Btu/h are regulated as consumer products by the US Department of Energy Code of Federal Regulations DOE 10 CFR 430. SEER, SEER2 and HSPF values for single-phase products are set by the US Department of Energy.

c. DOE 10 CFR 430 Subpart B Appendix M1 includes the test procedure updates effective 1/1/2023 that will be incorporated in AHRI 210/240—2023.

d. This table is a replica of ASHRAE 90.1 Table 6.8.1-2 Electrically Operated Air-Cooled Unitary Heat Pumps—Minimum Efficiency Requirements.

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TABLE C403.3.2(3)
WATER-CHILLING PACKAGES—MINIMUM EFFICIENCY REQUIREMENTS[a, b, e, f]

EQUIPMENT TYPE	SIZE CATEGORY	UNITS	PATH A	PATH B	TEST PROCEDURE[c]
Air cooled chillers	< 150 tons	EER (Btu/Wh)	≥ 10.100 FL	≥ 9.700 FL	AHRI 550/590
			≥ 13.700 IPLV.IP	≥ 15.800 IPLV.IP	
	≥ 150 tons		≥ 10.100 FL	≥ 9.700FL	
			≥ 14.000 IPLV.IP	≥ 16.100 IPLV.IP	
Air cooled without condenser, electrically operated	All capacities	EER (Btu/Wh)	Air-cooled chillers without condenser must be rated with matching condensers and comply with air-cooled chiller efficiency requirements		AHRI 550/590
Water cooled, electrically operated positive displacement	< 75 tons	kW/ton	≤ 0.750 FL	≤ 0.780 FL	AHRI 550/590
			≤ 0.600 IPLV.IP	≤ 0.500 IPLV.IP	
	≥ 75 tons and < 150 tons		≤ 0.720 FL	≤ 0.750 FL	
			≤ 0.560 IPLV.IP	≤ 0.490 IPLV.IP	
	≥ 150 tons and < 300 tons		≤ 0.660 FL	≤ 0.680 FL	
			≤ 0.540 IPLV.IP	≤ 0.440 IPLV.IP	
	≥ 300 tons and < 600 tons		≤ 0.610 FL	≤ 0.625 FL	
			≤ 0.520 IPLV.IP	≤ 0.410 IPLV.IP	
	≥ 600 tons		≤ 0.560 FL	≤ 0.585 FL	
			≤ 0.500 IPLV.IP	≤ 0.380 IPLV.IP	
Water cooled, electrically operated centrifugal	< 150 tons	kW/ton	≤ 0.610 FL	≤ 0.695 FL	AHRI 550/590
			≤ 0.550 IPLV.IP	≤ 0.440 IPLV.IP	
			≤ 0.610 FL	≤ 0.635 FL	
			≤ 0.550 IPLV.IP	≤ 0.400 IPLV.IP	
	≥ 300 tons and < 400 tons		≤ 0.560 FL	≤ 0.595 FL	
			≤ 0.520 IPLV.IP	≤ 0.390 IPLV.IP	
	≥ 400 tons and < 600 tons		≤ 0.560 FL	≤ 0.585 FL	
			≤ 0.500 IPLV.IP	≤ 0.380 IPLV.IP	
	≥ 600 tons		≤ 0.560 FL	≤ 0.585 FL	
			≤ 0.500 IPLV.IP	≤ 0.380 IPLV.IP	
Air cooled absorption, single effect	All capacities	COP (W/W)	≥ 0.600 FL	NA[d]	AHRI 560
Water cooled absorption, single effect	All capacities	COP (W/W)	≥ 0.700 FL	NA[d]	AHRI 560
Absorption double effect, indirect fired	All capacities	COP (W/W)	≥ 1.000 FL	NA[d]	AHRI 560
			≥ 0.150 IPLV.IP		
Absorption double effect, direct fired	All capacities	COP (W/W)	≥ 1.000 FL	NA[d]	AHRI 560
			≥ 1.000 IPLV		

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b. The requirements for centrifugal chillers shall be adjusted for nonstandard rating conditions per Section C403.3.2.1 and are applicable only for the range of conditions listed there. The requirements for air-cooled, water-cooled positive displacement and absorption chillers are at standard rating conditions defined in the reference test procedure.
c. Both the full-load and IPLV.IP requirements must be met or exceeded to comply with this standard. When there is a Path B, compliance can be with either Path A or Path B for any application.
d. NA means the requirements are not applicable for Path B, and only Path A can be used for compliance.
e. FL is the full-load performance requirements, and IPLV.IP is for the part-load performance requirements.
f. This table is a replica of ASHRAE 90.1 Table 6.8.1-3 Water-Chilling Packages—Minimum Efficiency Requirements.

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TABLE C403.3.2(4)
ELECTRICALLY OPERATED PACKAGED TERMINAL AIR CONDITIONERS, PACKAGED TERMINAL HEAT PUMPS, SINGLE-PACKAGE VERTICAL AIR CONDITIONERS, SINGLE-PACKAGE VERTICAL HEAT PUMPS, ROOM AIR CONDITIONERS AND ROOM AIR-CONDITIONER HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[e]

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY[d]	TEST PROCEDURE[a]
PTAC (cooling mode) standard size	< 7,000 Btu/h	95°F db/75°F wb outdoor air[c]	11.9 EER	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		14.0 – (0.300 × Cap/1,000) EER[d]	
	> 15,000 Btu/h		9.5 EER	
PTAC (cooling mode) nonstandard size[a]	< 7,000 Btu/h	95°F db/75°F wb outdoor air[c]	9.4 EER	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		10.9 – (0.213 × Cap/1,000) EER[d]	
	> 15,000 Btu/h		7.7 EER	
PTHP (cooling mode) standard size	< 7,000 Btu/h	95°F db/75°F wb outdoor air[c]	11.9 EER	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		14.0 – (0.300 × Cap/1,000) EER[d]	
	> 15,000 Btu/h		9.5 EER	
PTHP (cooling mode) nonstandard size[b]	< 7,000 Btu/h	95°F db/75°F wb outdoor air[c]	9.3 EER	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		10.8 – (0.213 × Cap/1,000) EER[d]	
	> 15,000 Btu/h		7.6 EER	
PTHP (heating mode) standard size	< 7,000 Btu/h	47°F db/43°F wb outdoor air	3.3 COP_H	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		3.7 – (0.052 × Cap/1,000) COP_H[d]	
	> 15,000 Btu/h		2.90 COP_H	
PTHP (heating mode) nonstandard size[b]	< 7,000 Btu/h	47°F db/43°F wb outdoor air	2.7 COP_H	AHRI 310/380
	≥ 7,000 Btu/h and ≤ 15,000 Btu/h		2.9 – (0.026 × Cap/1000) COP_H[d]	
	> 15,000 Btu/h		2.5 COP_H	
SPVAC (cooling mode) single and three phase	< 65,000 Btu/h	95°F db/75°F wb outdoor air[c]	11.0 EER	AHRI 390
	≥ 65,000 Btu/h and ≤ 135,000 Btu/h		10.0 EER	
	≥ 135,000 Btu/h and ≤ 240,000 Btu/h		10.0 EER	
SPVHP (cooling mode)	< 65,000 Btu/h	95°F db/75°F wb outdoor air[c]	11.0 EER	AHRI 390
	≥ 65,000 Btu/h and ≤ 135,000 Btu/h		10.0 EER	
	≥ 135,000 Btu/h and ≤ 240,000 Btu/h		10.1 EER	
SPVHP (heating mode)	< 65,000 Btu/h	47°F db/43°F wb outdoor air	3.3 COP_H	AHRI 390
	≥ 65,000 Btu/h and ≤ 135,000 Btu/h		3.0 COP_H	
	≥ 135,000 Btu/h and ≤ 240,000 Btu/h		3.0 COP_H	

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TABLE C403.3.2(4)—continued
ELECTRICALLY OPERATED PACKAGED TERMINAL AIR CONDITIONERS, PACKAGED TERMINAL HEAT PUMPS, SINGLE-PACKAGE VERTICAL AIR CONDITIONERS, SINGLE-PACKAGE VERTICAL HEAT PUMPS, ROOM AIR CONDITIONERS AND ROOM AIR-CONDITIONER HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[e]

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY[d]	TEST PROCEDURE[a]
Room air conditioners without reverse cycle with louvered sides for applications outside US	< 6,000 Btu/h	—	11.0 CEER	ANSI/AHAM RAC-1
	≥ 6,000 Btu/h and < 8,000 Btu/h	—	11.0 CEER	
	≥ 8,000 Btu/h and < 14,000 Btu/h	—	10.9 CEER	
	≥ 14,000 Btu/h and < 20,000 Btu/h	—	10.7 CEER	
	≥ 20,000 Btu/h and < 28,000 Btu/h	—	9.4 CEER	
	≥ 28,000 Btu/h	—	9.0 CEER	
Room air conditioners without louvered sides	< 6,000 Btu/h	—	10.0 CEER	ANSI/AHAM RAC-1
	≥ 6,000 Btu/h and < 8,000 Btu/h	—	10.0 CEER	
	≥ 8,000 Btu/h and < 11,000 Btu/h	—	9.6 CEER	
	≥ 11,000 Btu/h and < 14,000 Btu/h	—	9.5 CEER	
	≥ 14,000 Btu/h and < 20,000 Btu/h	—	9.3 CEER	
	≥ 20,000 Btu/h	—	9.4 CEER	
Room air conditioners with reverse cycle, with louvered sides for applications outside US	< 20,000 Btu/h	—	9.8 CEER	ANSI/AHAM RAC-1
	≥ 20,000 Btu/h	—	9.3 CEER	
Room air conditioners with reverse cycle without louvered sides for applications outside US	< 14,000 Btu/h	—	9.3 CEER	ANSI/AHAM RAC-1
	≥ 14,000 Btu/h	—	8.7 CEER	
Room air conditioners, casement only for applications outside US	All	—	9.5 CEER	ANSI/AHAM RAC-1
Room air conditioners, casement slider for applications outside US	All	—	10.4 CEER	ANSI/AHAM RAC-1

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) – 32]/1.8, wb = wet bulb, db = dry bulb.

"Cap" = The rated cooling capacity of the project in Btu/h. Where the unit's capacity is less than 7,000 Btu/h, use 7,000 Btu/h in the calculation. Where the unit's capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculations.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Nonstandard size units must be factory labeled as follows: "MANUFACTURED FOR NONSTANDARD SIZE APPLICATIONS ONLY; NOT TO BE INSTALLED IN NEW STANDARD PROJECTS." Nonstandard size efficiencies apply only to units being installed in existing sleeves having an external wall opening of less than 16 inches (406 mm) high or less than 42 inches (1067 mm) wide and having a cross-sectional area less than 670 square inches (0.43 m^2).

c. The cooling-mode wet bulb temperature requirement only applies for units that reject condensate to the condenser coil.

d. "Cap" in EER and COPH equations for PTACs and PTHPs means cooling capacity in Btu/h at 95°F outdoor dry-bulb temperature.

e. This table is a replica of ASHRAE 90.1 Table 6.8.1-4 Electrically Operated Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Single-Package Vertical Air Conditioners, Single-Package Vertical Heat Pumps, Room Air Conditioners, and Room Air-Conditioner Heat Pumps—Minimum Efficiency Requirements.

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TABLE C403.3.2(5)
WARM-AIR FURNACES AND COMBINATION WARM-AIR FURNACES/AIR-CONDITIONING UNITS, WARM-AIR DUCT FURNACES AND UNIT HEATERS—MINIMUM EFFICIENCY REQUIREMENTS[g]

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Warm-air furnace, gas fired for application outside the US	< 225,000 Btu/h	Maximum capacity[c]	80% AFUE (nonweatherized) or 81% AFUE (weatherized) or 80% E_t[b, d]	DOE 10 CFR 430 Appendix N or Section 2.39, Thermal Efficiency, ANSI Z21.47
Warm-air furnace, gas fired	< 225,000 Btu/h	Maximum capacity[c]	80% E_t[b, d] before 1/1/2023 81% E_t[d] after 1/1/2023	Section 2.39, Thermal Efficiency, ANSI Z21.47
Warm-air furnace, oil fired for application outside the US	< 225,000 Btu/h	Maximum capacity[c]	83% AFUE (nonweatherized) or 78% AFUE (weatherized) or 80% E_t[b, d]	DOE 10 CFR 430 Appendix N or Section 42, Combustion, UL 727
Warm-air furnace, oil fired	< 225,000 Btu/h	Maximum capacity[c]	80% E_t before 1/1/2023 82% E_t[d] after 1/1/2023	Section 42, Combustion, UL 727
Electric furnaces for applications outside the US	< 225,000 Btu/h	All	96% AFUE	DOE 10 CFR 430 Appendix N
Warm-air duct furnaces, gas fired	All capacities	Maximum capacity[c]	80% E_c[e]	Section 2.10, Efficiency, ANSI Z83.8
Warm-air unit heaters, gas fired	All capacities	Maximum capacity[c]	80% E_c[e, f]	Section 2.10, Efficiency, ANSI Z83.8
Warm-air unit heaters, oil fired	All capacities	Maximum capacity[c]	80% E_c[e, f]	Section 40, Combustion, UL 731

For SI: 1 British thermal unit per hour = 0.2931 W.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Combination units (i.e., furnaces contained within the same cabinet as an air conditioner) not covered by DOE 10 CFR 430 (i.e., three-phase power or with cooling capacity greater than or equal to 65,000 Btu/h) may comply with either rating. All other units greater than 225,000 Btu/h sold in the US must meet the AFUE standards for consumer products and test using USDOE's AFUE test procedure at DOE 10 CFR 430, Subpart B, Appendix N.

c. Compliance of multiple firing rate units shall be at the maximum firing rate.

d. E_t = thermal efficiency. Units must also include an interrupted or intermittent ignition device (IID), have jacket losses not exceeding 0.75 percent of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.

e. E_c = combustion efficiency (100 percent less flue losses). See test procedure for detailed discussion.

f. Units must also include an interrupted or intermittent ignition device (IID) and have either power venting or an automatic flue damper.

g. This table is a replica of ASHRAE 90.1 Table 6.8.1-5 Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units, Warm-Air Duct Furnaces, and Unit Heaters—Minimum Efficiency Requirements.

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TABLE C403.3.2(6)
GAS- AND OIL-FIRED BOILERS—MINIMUM EFFICIENCY REQUIREMENTS[i]

EQUIPMENT TYPE[b]	SUBCATEGORY OR RATING CONDITION	SIZE CATEGORY (INPUT)	MINIMUM EFFICIENCY	EFFICIENCY AS OF 3/2/2022	TEST PROCEDURE[a]
Boilers, hot water	Gas fired	< 300,000 Btu/h[g, h] for applications outside US	82% AFUE	82% AFUE	DOE 10 CFR 430 Appendix N
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	80% E_t[d]	80% E_t[d]	DOE 10 CFR 431.86
		> 2,500,000 Btu/h[b]	82% E_c[c]	82% E_c[c]	
	Oil fired[f]	< 300,000 Btu/h[g,h] for applications outside US	84% AFUE	84% AFUE	DOE 10 CFR 430 Appendix N
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	82% E_t[d]	82% E_t[d]	DOE 10 CFR 431.86
		> 2,500,000 Btu/h[b]	84% E_c[c]	84% E_c[c]	
Boilers, steam	Gas fired	< 300,000 Btu/h[g] for applications outside US	80% AFUE	80% AFUE	DOE 10 CFR 430 Appendix N
	Gas fired—all, except natural draft	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	79% E_t[d]	79% E_t[d]	DOE 10 CFR 431.86
		> 2,500,000 Btu/h[b]	79% E_t[d]	79% E_t[d]	
	Gas fired—natural draft	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	77% E_t[d]	79% E_t[d]	
		> 2,500,000 Btu/h[b]	77% E_t[d]	79% E_t[d]	
	Oil fired[f]	< 300,000 Btu/h[g] for applications outside US	82% AFUE	82% AFUE	DOE 10 CFR 430 Appendix N
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	81% E_t[d]	81% E_t[d]	DOE 10 CFR 431.86
		> 2,500,000 Btu/h[b]	81% E_t[d]	81% E_t[d]	

For SI: 1 British thermal unit per hour = 0.2931 W.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.

c. E_c = Combustion efficiency (100 percent less flue losses).

d. E_t = Thermal efficiency.

e. Maximum capacity—minimum and maximum ratings as provided for and allowed by the unit's controls.

f. Includes oil-fired (residual).

g. Boilers shall not be equipped with a constant burning pilot light.

h. A boiler not equipped with a tankless domestic water-heating coil shall be equipped with an automatic means for adjusting the temperature of the water such that an incremental change in inferred heat load produces a corresponding incremental change in the temperature of the water supplied.

i. This table is a replica of ASHRAE 90.1 Table 6.8.1-6 Gas- and Oil-Fired Boilers—Minimum Efficiency Requirements.

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TABLE C403.3.2(7)
PERFORMANCE REQUIREMENTS FOR HEAT REJECTION EQUIPMENT—MINIMUM EFFICIENCY REQUIREMENTS[i]

EQUIPMENT TYPE	TOTAL SYSTEM HEAT-REJECTION CAPACITY AT RATED CONDITIONS	SUBCATEGORY OR RATING CONDITION[h]	PERFORMANCE REQUIRED[b, c, d, f, g]	TEST PROCEDURE[a, e]
Propeller or axial fan open-circuit cooling towers	All	95°F entering water 85°F leaving water 75°F entering wb	≥ 40.2 gpm/hp	CTI ATC-105 and CTI STD-201 RS
Centrifugal fan open-circuit cooling towers	All	95°F entering water 85°F leaving water 75°F entering wb	≥ 20.0 gpm/hp	CTI ATC-105 and CTI STD-201 RS
Propeller or axial fan closed-circuit cooling towers	All	102°F entering water 90°F leaving water 75°F entering wb	≥ 16.1 gpm/hp	CTI ATC-105S and CTI STD-201 RS
Centrifugal fan closed-circuit cooling towers	All	102°F entering water 90°F leaving water 75°F entering wb	≥ 7.0 gpm/hp	CTI ATC-105S and CTI STD-201 RS
Propeller or axial fan dry coolers (air-cooled fluid coolers)	All	115°F entering water 105°F leaving water 95°F entering wb	≥ 4.5 gpm/hp	CTI ATC-105DS
Propeller or axial fan evaporative condensers	All	R-448A test fluid 165°F entering gas temperature 105°F condensing temperature 75°F entering wb	≥ 160,000 Btu/h × hp	CTI ATC-106
Propeller or axial fan evaporative condensers	All	Ammonia test fluid 140°F entering gas temperature 96.3°F condensing temperature 75°F entering wb	≥ 134,000 Btu/h × hp	CTI ATC-106
Centrifugal fan evaporative condensers	All	R-448A test fluid 165°F entering gas temperature 105°F condensing temperature 75°F entering wb	≥ 137,000 Btu/h × hp	CTI ATC-106
Centrifugal fan evaporative condensers	All	Ammonia test fluid 140°F entering gas temperature 96.3°F condensing temperature 75°F entering wb	≥ 110,000 Btu/h × hp	CTI ATC-106
Air-cooled condensers	All	125°F condensing temperature 190°F entering gas temperature 15°F subcooling 95°F entering db	≥ 176,000 Btu/h × hp	AHRI 460

For SI: °C = [(°F) – 32]/1.8, L/s × kW = (gpm/hp)/(11.83), COP = (Btu/h × hp)/(2550.7), db = dry bulb temperature, wb = wet bulb temperature.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. For purposes of this table, open-circuit cooling tower performance is defined as the water-flow rating of the tower at the thermal rating condition listed in the table divided by the fan motor nameplate power.

c. For purposes of this table, closed-circuit cooling tower performance is defined as the process water-flow rating of the tower at the thermal rating condition listed in the table divided by the sum of the fan motor nameplate power and the integral spray pump motor nameplate power.

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TABLE C403.3.2(7)—continued
PERFORMANCE REQUIREMENTS FOR HEAT REJECTION EQUIPMENT—MINIMUM EFFICIENCY REQUIREMENTS[i]

d. For purposes of this table, dry-cooler performance is defined as the process water-flow rating of the unit at the thermal rating condition listed in the table divided by the total fan motor nameplate power of the unit, and air-cooled condenser performance is defined as the heat rejected from the refrigerant divided by the total fan motor nameplate power of the unit.
e. The efficiencies and test procedures for both open- and closed-circuit cooling towers are not applicable to hybrid cooling towers that contain a combination of separate wet and dry heat exchange sections. The certification requirements do not apply to field-erected cooling towers.
f. All cooling towers shall comply with the minimum efficiency listed in the table for that specific type of tower with the capacity effect of any project-specific accessories and/or options included in the capacity of the cooling tower.
g. For purposes of this table, evaporative condenser performance is defined as the heat rejected at the specified rating condition in the table, divided by the sum of the fan motor nameplate power and the integral spray pump nameplate power.
h. Requirements for evaporative condensers are listed with ammonia (R-717) and R-448A as test fluids in the table. Evaporative condensers intended for use with halocarbon refrigerants other than R-448A must meet the minimum efficiency requirements listed with R-448A as the test fluid. For ammonia, the condensing temperature is defined as the saturation temperature corresponding to the refrigerant pressure at the condenser entrance. For R-448A, which is a zeotropic refrigerant, the condensing temperature is defined as the arithmetic average of the dew point and the bubble point temperatures corresponding to the refrigerant pressure at the condenser entrance.
i. This table is a replica of ASHRAE 90.1 Table 6.8.1-7 Performance Requirements for Heat Rejection Equipment—Minimum Efficiency Requirements.

TABLE C403.3.2(8)
ELECTRICALLY OPERATED VARIABLE-REFRIGERANT-FLOW AIR CONDITIONERS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SIZE CATEGORY	HEATING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
VRF air conditioners, air cooled	< 65,000 Btu/h	All	VRF multisplit system	13.0 SEER	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)	VRF multisplit system	11.2 EER 13.1 IEER 15.5 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h	Electric resistance (or none)	VRF multisplit system	11.0 EER 12.9 IEER 14.9 IEER	
	≥ 240,000 Btu/h	Electric resistance (or none)	VRF multisplit system	10.0 EER 11.6 IEER 13.9 IEER	

For SI: 1 British thermal unit per hour = 0.2931 W.
a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b. This table is a replica of ASHRAE 90.1 Table 6.8.1-8 Electrically Operated Variable-Refrigerant-Flow Air Conditioners—Minimum Efficiency Requirements.

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TABLE C403.3.2(9)
ELECTRICALLY OPERATED VARIABLE-REFRIGERANT-FLOW AND APPLIED HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SIZE CATEGORY	HEATING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
VRF air cooled (cooling mode)	< 65,000 Btu/h	All	VRF multisplit system	13.0 SEER	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h	Electric resistance (or none)	VRF multisplit system	11.0 EER 12.9 IEER 14.6 IEER	
			VRF multisplit system with heat recovery	10.8 EER 12.7 IEER 14.4 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h		VRF multisplit system	10.6 EER 12.3 IEER 13.9 IEER	
			VRF multisplit system with heat recovery	10.4 EER 12.1 IEER 13.7 IEER	
	≥ 240,000 Btu/h		VRF multisplit system	9.5 EER 11.0 IEER 12.7 IEER	
			VRF multisplit system with heat recovery	9.3 EER 10.8 IEER 12.5 IEER	
VRF water source (cooling mode)	< 65,000 Btu/h	All	VRF multisplit systems 86°F entering water	12.0 EER 16.0 IEER	AHRI 1230
			VRF multisplit systems with heat recovery 86°F entering water	11.8 EER 15.8 IEER	
	≥ 65,000 Btu/h and < 135,000 Btu/h		VRF multisplit system 86°F entering water	12.0 EER 16.0 IEER	
			VRF multisplit system with heat recovery 86°F entering water	11.8 EER 15.8 IEER	
	≥ 135,000 Btu/h and < 240,000 Btu/h		VRF multisplit system 86°F entering water	10.0 EER 14.0 IEER	
			VRF multisplit system with heat recovery 86°F entering water	9.8 EER 13.8 IEER	
	≥ 240,000 Btu/h		VRF multisplit system 86°F entering water	10.0 EER 12.0 IEER	
			VRF multisplit system with heat recovery 86°F entering water	9.8 EER 11.8 IEER	
VRF groundwater source (cooling mode)	< 135,000 Btu/h	All	VRF multisplit system 59°F entering water	16.2 EER	AHRI 1230
			VRF multisplit system with heat recovery 59°F entering water	16.0 EER	
	≥ 135,000 Btu/h		VRF multisplit system 59°F entering water	13.8 EER	
			VRF multisplit system with heat recovery 59°F entering water	13.6 EER	

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TABLE C403.3.2(9)—continued
ELECTRICALLY OPERATED VARIABLE-REFRIGERANT-FLOW AND APPLIED HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SIZE CATEGORY	HEATING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
VRF ground source (cooling mode)	< 135,000 Btu/h	All	VRF multisplit system 77°F entering water	13.4 EER	AHRI 1230
			VRF multisplit system with heat recovery 77°F entering water	13.2 EER	
	≥ 135,000 Btu/h		VRF multisplit system 77°F entering water	11.0 EER	
			VRF multisplit system with heat recovery 77°F entering water	10.8 EER	
VRF air cooled (heating mode)	< 65,000 Btu/h (cooling capacity)		VRF multisplit system	7.7 HSPF	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h (cooling capacity)		VRF multisplit system 47°F db/43°F wb outdoor air	3.3 COP_H	
			17°F db/15°F wb outdoor air	2.25 COP_H	
	≥ 135,000 Btu/h (cooling capacity)		VRF multisplit system 47°F db/43°F wb outdoor air	3.2 COP_H	
			17°F db/15°F wb outdoor air	2.05 COP_H	
VRF water source (heating mode)	< 65,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	4.2 COP_H 4.3 COP_H	AHRI 1230
	≥ 65,000 Btu/h and < 135,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	4.2 COP_H 4.3 COP_H	
	≥ 135,000 Btu/h and < 240,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	3.9 COP_H 4.0 COP_H	
	≥ 240,000 Btu/h (cooling capacity)		VRF multisplit system 68°F entering water	3.9 COP_H	
VRF groundwater source (heating mode)	< 135,000 Btu/h (cooling capacity)		VRF multisplit system 50°F entering water	3.6 COP_H	AHRI 1230
	≥ 135,000 Btu/h (cooling capacity)		VRF multisplit system 50°F entering water	3.3 COP_H	
VRF ground source (heating mode)	< 135,000 Btu/h (cooling capacity)		VRF multisplit system 32°F entering water	3.1 COP_H	AHRI 1230
	≥ 135,000 Btu/h (cooling capacity)		VRF multisplit system 32°F entering water	2.8 COP_H	

For SI: °C = [(°F) – 32]/1.8, 1 British thermal unit per hour = 0.2931 W, db = dry bulb temperature, wb = wet bulb temperature.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. This table is a replica of ASHRAE 90.1 Table 6.8.1-9 Electrically Operated Variable-Refrigerant-Flow and Applied Heat Pumps—Minimum Efficiency Requirements.

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TABLE C403.3.2(10)
FLOOR-MOUNTED AIR CONDITIONERS AND CONDENSING UNITS SERVING COMPUTER ROOMS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	STANDARD MODEL	NET SENSIBLE COOLING CAPACITY	MINIMUM NET SENSIBLE COP	RATING CONDITIONS RETURN AIR (dry bulb/dew point)	TEST PROCEDURE[a]
Air cooled	Downflow	< 80,000 Btu/h	2.70	85°F/52°F (Class 2)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.58		
		≥ 295,000 Btu/h	2.36		
	Upflow—ducted	< 80,000 Btu/h	2.67		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.55		
		≥ 295,000 Btu/h	2.33		
	Upflow—nonducted	< 65,000 Btu/h	2.16	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.04		
		≥ 240,000 Btu/h	1.89		
	Horizontal	< 65,000 Btu/h	2.65	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.55		
		≥ 240,000 Btu/h	2.47		
Air cooled with fluid economizer	Downflow	< 80,000 Btu/h	2.70	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.58		
		≥ 295,000 Btu/h	2.36		
	Upflow—ducted	< 80,000 Btu/h	2.67		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.55		
		≥ 295,000 Btu/h	2.33		
	Upflow—nonducted	< 65,000 Btu/h	2.09	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	1.99		
		≥ 240,000 Btu/h	1.81		
	Horizontal	< 65,000 Btu/h	2.65	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.55		
		≥ 240,000 Btu/h	2.47		
Water cooled	Downflow	< 80,000 Btu/h	2.82	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.73		
		≥ 295,000 Btu/h	2.67		
	Upflow—ducted	< 80,000 Btu/h	2.79		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.70		
		≥ 295,000 Btu/h	2.64		
	Upflow—nonducted	< 65,000 Btu/h	2.43	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.32		
		≥ 240,000 Btu/h	2.20		
	Horizontal	< 65,000 Btu/h	2.79	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.68		
		≥ 240,000 Btu/h	2.60		

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TABLE C403.3.2(10)—continued
FLOOR-MOUNTED AIR CONDITIONERS AND CONDENSING UNITS SERVING COMPUTER ROOMS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	STANDARD MODEL	NET SENSIBLE COOLING CAPACITY	MINIMUM NET SENSIBLE COP	RATING CONDITIONS RETURN AIR (dry bulb/dew point)	TEST PROCEDURE[a]
Water cooled with fluid economizer	Downflow	< 80,000 Btu/h	2.77	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.68		
		≥ 295,000 Btu/h	2.61		
	Upflow—ducted	< 80,000 Btu/h	2.74		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.65		
		≥ 295,000 Btu/h	2.58		
	Upflow—nonducted	< 65,000 Btu/h	2.35	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.24		
		≥ 240,000 Btu/h	2.12		
	Horizontal	< 65,000 Btu/h	2.71	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.60		
		≥ 240,000 Btu/h	2.54		
Glycol cooled	Downflow	< 80,000 Btu/h	2.56	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.24		
		≥ 295,000 Btu/h	2.21		
	Upflow—ducted	< 80,000 Btu/h	2.53		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.21		
		≥ 295,000 Btu/h	2.18		
	Upflow, nonducted	< 65,000 Btu/h	2.08	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	1.90		
		≥ 240,000 Btu/h	1.81		
	Horizontal	< 65,000 Btu/h	2.48	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.18		
		≥ 240,000 Btu/h	2.18		
Glycol cooled with fluid economizer	Downflow	< 80,000 Btu/h	2.51	85°F/52°F (Class 1)	AHRI 1360
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.19		
		≥ 295,000 Btu/h	2.15		
	Upflow—ducted	< 80,000 Btu/h	2.48		
		≥ 80,000 Btu/h and < 295,000 Btu/h	2.16		
		≥ 295,000 Btu/h	2.12		
	Upflow—nonducted	< 65,000 Btu/h	2.00	75°F/52°F (Class 1)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	1.82		
		≥ 240,000 Btu/h	1.73		
	Horizontal	< 65,000 Btu/h	2.44	95°F/52°F (Class 3)	
		≥ 65,000 Btu/h and < 240,000 Btu/h	2.10		
		≥ 240,000 Btu/h	2.10		

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) – 32]/1.8, COP = (Btu/h × hp)/(2,550.7).

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. This table is a replica of ASHRAE 90.1 Table 6.8.1-10 Floor-Mounted Air Conditioners and Condensing Units Serving Computer Rooms—Minimum Efficiency Requirements.

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TABLE C403.3.2(11)
VAPOR-COMPRESSION-BASED INDOOR POOL DEHUMIDIFIERS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Single package indoor (with or without economizer)	Rating Conditions: A or C	3.5 MRE	AHRI 910
Single package indoor water cooled (with or without economizer)	Rating Conditions: A, B or C	3.5 MRE	
Single package indoor air cooled (with or without economizer)	Rating Conditions: A, B or C	3.5 MRE	
Split system indoor air cooled (with or without economizer)	Rating Conditions: A, B or C	3.5 MRE	

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b. This table is a replica of ASHRAE 90.1 Table 6.8.1-12 Vapor-Compression-Based Indoor Pool Dehumidifiers—Minimum Efficiency Requirements.

TABLE C403.3.2(12)
ELECTRICALLY OPERATED DX-DOAS UNITS, SINGLE-PACKAGE AND REMOTE CONDENSER, WITHOUT ENERGY RECOVERY—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air cooled (dehumidification mode)	—	4.0 ISMRE	AHRI 920
Air-source heat pumps (dehumidification mode)	—	4.0 ISMRE	AHRI 920
Water cooled (dehumidification mode)	Cooling tower condenser water	4.9 ISMRE	AHRI 920
	Chilled water	6.0 ISMRE	
Air-source heat pump (heating mode)	—	2.7 ISCOP	AHRI 920
Water-source heat pump (dehumidification mode)	Ground source, closed loop	4.8 ISMRE	AHRI 920
	Ground-water source	5.0 ISMRE	
	Water source	4.0 ISMRE	
Water-source heat pump (heating mode)	Ground source, closed loop	2.0 ISCOP	AHRI 920
	Ground-water source	3.2 ISCOP	
	Water source	3.5 ISCOP	

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b. This table is a replica of ASHRAE 90.1 Table 6.8.1-13 Electrically Operated DX-DOAS Units, Single-Package and Remote Condenser, without Energy Recovery—Minimum Efficiency Requirements.

TABLE C403.3.2(13)
ELECTRICALLY OPERATED DX-DOAS UNITS, SINGLE-PACKAGE AND REMOTE CONDENSER, WITH ENERGY RECOVERY—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Air cooled (dehumidification mode)	—	5.2 ISMRE	AHRI 920
Air-source heat pumps (dehumidification mode)	—	5.2 ISMRE	AHRI 920
Water cooled (dehumidification mode)	Cooling tower condenser water	5.3 ISMRE	AHRI 920
	Chilled water	6.6 ISMRE	
Air-source heat pump (heating mode)	—	3.3 ISCOP	AHRI 920
Water-source heat pump (dehumidification mode)	Ground source, closed loop	5.2 ISMRE	AHRI 920
	Ground-water source	5.8 ISMRE	
	Water source	4.8 ISMRE	
Water-source heat pump (heating mode)	Ground source, closed loop	3.8 ISCOP	AHRI 920
	Ground-water source	4.0 ISCOP	
	Water source	4.8 ISCOP	

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.
b. This table is a replica of ASHRAE 90.1 Table 6.8.1-14 Electrically Operated DX-DOAS Units, Single-Package and Remote Condenser, with Energy Recovery—Minimum Efficiency Requirements.

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TABLE C403.3.2(14)
ELECTRICALLY OPERATED WATER-SOURCE HEAT PUMPS—MINIMUM EFFICIENCY REQUIREMENTS[c]

EQUIPMENT TYPE	SIZE CATEGORY[b]	HEATING SECTION TYPE	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY	TEST PROCEDURE[a]
Water-to-air, water loop (cooling mode)	< 17,000 Btu/h	All	86°F entering water	12.2 EER	ISO 13256-1
	≥ 17,000 Btu/h and < 65,000 Btu/h			13.0 EER	
	≥ 65,000 Btu/h and < 135,000 Btu/h			13.0 EER	
Water-to-air, ground water (cooling mode)	< 135,000 Btu/h	All	59°F entering water	18.0 EER	ISO 13256-1
Brine-to-air, ground loop (cooling mode)	< 135,000 Btu/h	All	77°F entering water	14.1 EER	ISO 13256-1
Water-to-water, water loop (cooling mode)	< 135,000 Btu/h	All	86°F entering water	10.6 EER	ISO 13256-2
Water-to-water, ground water (cooling mode)	< 135,000 Btu/h	All	59°F entering water	16.3 EER	ISO 13256-2
Brine-to-water, ground loop (cooling mode)	< 135,000 Btu/h	All	77°F entering water	12.1 EER	ISO 13256-2
Water-to-water, water loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	68°F entering water	4.3 COP_H	ISO 13256-1
Water-to-air, ground water (heating mode)	< 135,000 Btu/h (cooling capacity)	—	50°F entering water	3.7 COP_H	ISO 13256-1
Brine-to-air, ground loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	32°F entering water	3.2 COP_H	ISO 13256-1
Water-to-water, water loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	68°F entering water	3.7 COP_H	ISO 13256-1
Water-to-water, ground water (heating mode)	< 135,000 Btu/h (cooling capacity)	—	50°F entering water	3.1 COP_H	ISO 13256-2
Brine-to-water, ground loop (heating mode)	< 135,000 Btu/h (cooling capacity)	—	32°F entering water	2.5 COP_H	ISO 13256-2

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) – 32]/1.8.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Single-phase, US air-cooled heat pumps less than 19 kW are regulated as consumer products by DOE 10 CFR 430. SCOPC, SCOP2C, SCOPH and SCOP2H values for single-phase products are set by the USDOE.

c. This table is a replica of ASHRAE 90.1 Table 6.8.1-15 Electrically Operated Water-Source Heat Pumps—Minimum Efficiency Requirements.

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TABLE C403.3.2(15)
HEAT-PUMP AND HEAT RECOVERY CHILLER PACKAGES—MINIMUM EFFICIENCY REQUIREMENTS[g]

HEATING OPERATION													
EQUIPMENT TYPE	SIZE CATEGORY, ton_R	COOLING-ONLY OPERATION COOLING EFFICIENCY[c] AIR-SOURCE EER (FL/IPLV), Btu/W × h WATER-SOURCE POWER INPUT PER CAPACITY (FL/IPLV), kW/ton_R		HEATING SOURCE CONDITIONS (entering/ leaving water) OR OAT (db/wb), °F	HEAT-PUMP HEATING FULL-LOAD EFFICIENCY (COP_H)[b], W/W				HEAT RECOVERY CHILLER FULL-LOAD EFFICIENCY (COP_{HR})[c,d], W/W SIMULTANEOUS COOLING AND HEATING FULL-LOAD EFFICIENCY (COP_{SHC})[c], W/W				Test Procedure[a]
					Leaving Heating Water Temperature				Leaving Heating Water Temperature				
					Low	Medium	High	Boost	Low	Medium	High	Boost	
		Path A	Path B		105°F	120°F	140°F	140°F	105°F	120°F	140°F	140°F	
Air source	All sizes	≥ 9.595 FL ≥ 13.02 IPLV.IP	≥ 9.215 FL ≥ 15.01 IPLV.IP	47 db 43 wb[e]	≥ 3.290	≥ 2.770	≥ 2.310	NA	NA	NA	NA	NA	AHRI 550/590
		≥ 9.595 FL ≥ 13.30 IPLV.IP	≥ 9.215 FL ≥ 15.30 IPLV.IP	17 db 15 wb[e]	≥ 2.230	≥ 1.950	≥ 1.630	NA	NA	NA	NA	NA	
Water-source electrically operated positive displacement	< 75	≤ 0.7885 FL ≤ 0.6316 IPLV.IP	≤ 0.7875 FL ≤ 0.5145 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	AHRI 550/590
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	6.150	
	≥ 75 and < 150	≤ 0.7579 FL ≤ 0.5895 IPLV.IP	≤ 0.7140 FL ≤ 0.4620 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	6.150	
	≥ 150 and < 300	≤ 0.6947 FL ≤ 0.5684 IPLV.IP	≤ 0.7140 FL ≤ 0.4620 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	6.150	
	≥ 300 and < 600	≤ 0.6421 FL ≤ 0.5474 IPLV.IP	≤ 0.6563 FL ≤ 0.4305 IPLV.IP	54/44[f]	≥ 4.930	≥ 3.960	≥ 2.970	NA	≥ 8.900	≥ 6.980	≥ 5.000	NA	
				75/65[f]	NA	NA	NA	≥ 3.900	NA	NA	NA	6.850	
	≥ 600	≤ 0.5895 FL ≤ 0.5263 IPLV.IP	≤ 0.6143 FL ≤ 0.3990 IPLV.IP	54/44[f]	≥ 4.930	≥ 3.960	≥ 2.970	NA	≥ 8.900	≥ 6.980	≥ 5.000	NA	
				75/65[f]	NA	NA	NA	≥ 3.900	NA	NA	NA	6.850	
Water-source electrically operated centrifugal	< 75	≤ 0.6421 FL ≤ 0.5789 IPLV.IP	≤ 0.7316 FL ≤ 0.4632 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	AHRI 550/590
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	≥ 6.150	
	≥ 75 and < 150	≤ 0.5895 FL ≤ 0.5474 IPLV.IP	≤ 0.6684 FL ≤ 0.4211 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	≥ 6.150	
	≥ 150 and < 300	≤ 0.5895 FL ≤ 0.5263 IPLV.IP	≤ 0.6263 FL ≤ 0.4105 IPLV.IP	54/44[f]	≥ 4.640	≥ 3.680	≥ 2.680	NA	≥ 8.330	≥ 6.410	≥ 4.420	NA	
				75/65[f]	NA	NA	NA	≥ 3.550	NA	NA	NA	≥ 6.150	
	≥ 300 and < 600	≤ 0.5895 FL ≤ 0.5263 IPLV.IP	≤ 0.6158 FL ≤ 0.4000 IPLV.IP	54/44[f]	≥ 4.930	≥ 3.960	≥ 2.970	NA	≥ 8.900	≥ 6.980	≥ 5.000	NA	
				75/65[f]	NA	NA	NA	≥ 3.900	NA	NA	NA	≥ 6.850	
	≥ 600	≤ 0.5895 FL ≤ 0.5263 IPLV.IP	≤ 0.6158 FL ≤ 0.4000 IPLV.IP	54/44[f]	≥ 4.930	≥ 3.960	≥ 2.970	NA	≥ 8.900	≥ 6.980	≥ 5.000	NA	
				75/65[f]	NA	NA	NA	≥ 3.900	NA	NA	NA	≥ 6.850	

For SI: °C = [(°F) – 32]/1.8.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. Cooling-only rating conditions are standard rating conditions defined in AHRI 550/590, Table 1.

c. Heating full-load rating conditions are at rating conditions defined in AHRI 550/590, Table 1.

d. For water-cooled heat recovery chillers that have capabilities for heat rejection to a heat recovery condenser and a tower condenser, the COP_{HR} applies to operation at full load with 100 percent heat recovery (no tower rejection). Units that only have capabilities for partial heat recovery shall meet the requirements of Table C403.3.2(3).

e. Outdoor air entering dry-bulb (db) temperature and wet-bulb (wb) temperature.

f. Source-water entering and leaving water temperature.

g. This table is a replica of ASHRAE 90.1 Table 6.8.1-16 Heat-Pump and Heat Recovery Chiller Packages—Minimum Efficiency Requirements.

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TABLE C403.3.2(16)
CEILING-MOUNTED COMPUTER-ROOM AIR CONDITIONERS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	STANDARD MODEL	NET SENSIBLE COOLING CAPACITY	MINIMUM NET SENSIBLE COP	RATING CONDITIONS RETURN AIR (dry bulb/dew point)	TEST PROCEDURE[a]
Air cooled with free air discharge condenser	Ducted	< 29,000 Btu/h	2.05	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.02		
		≥ 65,000 Btu/h	1.92		
	Nonducted	< 29,000 Btu/h	2.08		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.05		
		≥ 65,000 Btu/h	1.94		
Air cooled with free air discharge condenser with fluid economizer	Ducted	< 29,000 Btu/h	2.01	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.97		
		≥ 65,000 Btu/h	1.87		
	Nonducted	< 29,000 Btu/h	2.04		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.00		
		≥ 65,000 Btu/h	1.89		
Air cooled with ducted condenser	Ducted	< 29,000 Btu/h	1.86	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.83		
		≥ 65,000 Btu/h	1.73		
	Nonducted	< 29,000 Btu/h	1.89		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.86		
		≥ 65,000 Btu/h	1.75		
Air cooled with fluid economizer and ducted condenser	Ducted	< 29,000 Btu/h	1.82	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.78		
		≥ 65,000 Btu/h	1.68		
	Nonducted	< 29,000 Btu/h	1.85		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.81		
		≥ 65,000 Btu/h	1.70		
Water cooled	Ducted	< 29,000 Btu/h	2.38	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.28		
		≥ 65,000 Btu/h	2.18		
	Nonducted	< 29,000 Btu/h	2.41		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.31		
		≥ 65,000 Btu/h	2.20		

(continued)

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TABLE C403.3.2(16)—continued
CEILING-MOUNTED COMPUTER-ROOM AIR CONDITIONERS—MINIMUM EFFICIENCY REQUIREMENTS[b]

EQUIPMENT TYPE	STANDARD MODEL	NET SENSIBLE COOLING CAPACITY	MINIMUM NET SENSIBLE COP	RATING CONDITIONS RETURN AIR (dry bulb/dew point)	TEST PROCEDURE[a]
Water cooled with fluid economizer	Ducted	< 29,000 Btu/h	2.33	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.23		
		≥ 65,000 Btu/h	2.13		
	Nonducted	< 29,000 Btu/h	2.36		
		≥ 29,000 Btu/h and < 65,000 Btu/h	2.26		
		≥ 65,000 Btu/h	2.16		
Glycol cooled	Ducted	< 29,000 Btu/h	1.97	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.93		
		≥ 65,000 Btu/h	1.78		
	Nonducted	< 29,000 Btu/h	2.00		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.98		
		≥ 65,000 Btu/h	1.81		
Glycol cooled with fluid economizer	Ducted	< 29,000 Btu/h	1.92	75°F/52°F (Class 1)	AHRI 1360
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.88		
		≥ 65,000 Btu/h	1.73		
	Nonducted	< 29,000 Btu/h	1.95		
		≥ 29,000 Btu/h and < 65,000 Btu/h	1.93		
		≥ 65,000 Btu/h	1.76		

For SI: 1 British thermal unit per hour = 0.2931 W, °C = [(°F) – 32]/1.8, COP = (Btu/h × hp)/(2,550.7).

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. This is a replica of ASHRAE 90.1 Table 6.8.1-17 Ceiling-Mounted Computer-Room Air Conditioners—Minimum Efficiency Requirements.

TABLE C403.3.3
MAXIMUM HOT GAS BYPASS CAPACITY

RATED CAPACITY	MAXIMUM HOT GAS BYPASS CAPACITY (% of total capacity)
≤ 240,000 Btu/h	50
> 240,000 Btu/h	25

For SI: 1 British thermal unit per hour = 0.2931 W.

C403.3.4 Boiler turndown. *Boiler systems* with design input of greater than 1,000,000 Btu/h (293 kW) shall comply with the turndown ratio specified in Table C403.3.4.

The system turndown requirement shall be met through the use of multiple single-input boilers, one or more *modulating boilers* or a combination of single-input and *modulating boilers*.

TABLE C403.3.4
BOILER TURNDOWN

BOILER SYSTEM DESIGN INPUT (Btu/h)	MINIMUM TURNDOWN RATIO
≥ 1,000,000 and ≤ 5,000,000	3 to 1
> 5,000,000 and ≤ 10,000,000	4 to 1
> 10,000,000	5 to 1

For SI: 1 British thermal unit per hour = 0.2931 W.

C403.4 Heating and cooling system controls. Each heating and cooling system shall be provided with controls in accordance with Sections C403.4.1 through C403.4.5.

C403.4.1 Thermostatic controls. The supply of heating and cooling energy to each *zone* shall be controlled by individual thermostatic controls capable of responding to temperature within the *zone*. Where humidification or dehumidification or both is provided, not fewer than one

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humidity control device shall be provided for each humidity control system.

Exception: Independent perimeter systems that are designed to offset only building envelope heat losses, gains or both serving one or more perimeter *zones* also served by an interior system provided that both of the following conditions are met:

1. The perimeter system includes not fewer than one thermostatic control *zone* for each building exposure having exterior walls facing only one orientation (within ±45 degrees) (0.8 rad) for more than 50 contiguous feet (15 240 mm).
2. The perimeter system heating and cooling supply is controlled by thermostats located within the *zones* served by the system.

C403.4.1.1 Heat pump supplementary heat. Heat pumps having supplementary electric resistance heat shall have controls that limit supplemental heat operation to only those times when one of the following applies:

1. The vapor compression cycle cannot provide the necessary heating energy to satisfy the thermostat setting.
2. The heat pump is operating in defrost mode.
3. The vapor compression cycle malfunctions.
4. The thermostat malfunctions.

C403.4.1.2 Deadband. Where used to control both heating and cooling, *zone* thermostatic controls shall be configured to provide a temperature range or deadband of not less than 5°F (2.8°C) within which the supply of heating and cooling energy to the *zone* is shut off or reduced to a minimum.

Exceptions:

1. Thermostats requiring manual changeover between heating and cooling modes.
2. Occupancies or applications requiring precision in indoor temperature control as *approved* by the *code official*.

C403.4.1.3 Setpoint overlap restriction. Where a *zone* has a separate heating and a separate cooling thermostatic control located within the *zone*, a limit switch, mechanical stop or direct digital control system with software programming shall be configured to prevent the heating setpoint from exceeding the cooling setpoint and to maintain a deadband in accordance with Section C403.4.1.2.

C403.4.1.4 Heated or cooled vestibules. The heating system for heated vestibules and air curtains with integral heating shall be provided with controls configured to shut off the source of heating when the outdoor air temperature is greater than 45°F (7°C). Vestibule heating and cooling systems shall be controlled by a thermostat located in the vestibule configured to limit heating to a temperature not greater than 60°F (16°C) and cooling to a temperature not less than 85°F (29°C).

Exception: Control of heating or cooling provided by site-recovered energy or transfer air that would otherwise be exhausted.

C403.4.1.5 Hot water boiler outdoor temperature setback control. Hot water boilers that supply heat to the building through one- or two-pipe heating systems shall have an outdoor setback control that lowers the boiler water temperature based on the outdoor temperature.

C403.4.2 Off-hour controls. Each *zone* shall be provided with thermostatic setback controls that are controlled by either an automatic time clock or programmable control system.

Exceptions:

1. *Zones* that will be operated continuously.
2. *Zones* with a full HVAC load demand not exceeding 6,800 Btu/h (2 kW) and having a manual shutoff switch located with *ready access*.

C403.4.2.1 Thermostatic setback. Thermostatic setback controls shall be configured to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C).

C403.4.2.2 Automatic setback and shutdown. Automatic time clock or programmable controls shall be capable of starting and stopping the system for seven different daily schedules per week and retaining their programming and time setting during a loss of power for not fewer than 10 hours. Additionally, the controls shall have a manual override that allows temporary operation of the system for up to 2 hours; a manually operated timer configured to operate the system for up to 2 hours; or an occupancy sensor.

C403.4.2.3 Automatic start and stop. Automatic start and stop controls shall be provided for each HVAC system. The automatic start controls shall be configured to automatically adjust the daily start time of the HVAC system in order to bring each space to the desired occupied temperature immediately prior to scheduled occupancy. Automatic stop controls shall be provided for each HVAC system with direct digital control of individual *zones*. The automatic stop controls shall be configured to reduce the HVAC system's heating temperature setpoint and increase the cooling temperature setpoint by not less than 2°F (1.11ºC) before scheduled unoccupied periods based on the thermal lag and acceptable drift in space temperature that is within comfort limits.

C403.4.3 Hydronic systems controls. The heating of fluids that have been previously mechanically cooled and the cooling of fluids that have been previously mechani-

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cally heated shall be limited in accordance with Sections C403.4.3.1 through C403.4.3.3. Hydronic heating systems comprised of multiple-packaged boilers and designed to deliver conditioned water or steam into a common distribution system shall include automatic controls configured to sequence operation of the boilers. Hydronic heating systems composed of a single boiler and greater than 500,000 Btu/h (146.5 kW) input design capacity shall include either a multistaged or modulating burner.

C403.4.3.1 Three-pipe system. Hydronic systems that use a common return system for both hot water and chilled water are prohibited.

C403.4.3.2 Two-pipe changeover system. Systems that use a common distribution system to supply both heated and chilled water shall be designed to allow a deadband between changeover from one mode to the other of not less than 15°F (8.3°C) outside air temperatures; be designed to and provided with controls that will allow operation in one mode for not less than 4 hours before changing over to the other mode; and be provided with controls that allow heating and cooling supply temperatures at the changeover point to be not more than 30°F (16.7°C) apart.

C403.4.3.3 Hydronic (water loop) heat pump systems. Hydronic heat pump systems shall comply with Sections C403.4.3.3.1 through C403.4.3.3.3.

C403.4.3.3.1 Temperature deadband. Hydronic heat pumps connected to a common heat pump water loop with central devices for heat rejection and heat addition shall have controls that are configured to provide a heat pump water supply temperature deadband of not less than 20°F (11°C) between initiation of heat rejection and heat addition by the central devices.

Exception: Where a system loop temperature optimization controller is installed and can determine the most efficient operating temperature based on real-time conditions of demand and capacity, deadbands of less than 20°F (11°C) shall be permitted.

C403.4.3.3.2 Heat rejection. The following shall apply to hydronic water loop heat pump systems in Climate Zones 3 through 8:

1. Where a closed-circuit cooling tower is used directly in the heat pump loop, either an automatic valve shall be installed to bypass the flow of water around the closed-circuit cooling tower, except for any flow necessary for freeze protection, or low-leakage positive-closure dampers shall be provided.
2. Where an open-circuit cooling tower is used directly in the heat pump loop, an automatic valve shall be installed to bypass all heat pump water flow around the open-circuit cooling tower.
3. Where an open-circuit or closed-circuit cooling tower is used in conjunction with a separate heat exchanger to isolate the open-circuit cooling tower from the heat pump loop, heat loss shall be controlled by shutting down the circulation pump on the cooling tower loop.

Exception: Where it can be demonstrated that a heat pump system will be required to reject heat throughout the year.

C403.4.3.3.3 Two-position valve. Each hydronic heat pump on the hydronic system having a total pump system power exceeding 10 hp (7.5 kW) shall have a two-position automatic valve interlocked to shut off the water flow when the compressor is off.

C403.4.4 Part-load controls. Hydronic systems greater than or equal to 300,000 Btu/h (87.9 kW) in design output capacity supplying heated or chilled water to comfort conditioning systems shall include controls that are configured to do all of the following:

1. Automatically reset the supply-water temperatures in response to varying building heating and cooling demand using coil valve position, zone-return water temperature, building-return water temperature or outside air temperature. The temperature shall be reset by not less than 25 percent of the design supply-to-return water temperature difference.
2. Automatically vary fluid flow for hydronic systems with a combined pump motor capacity of 2 hp (1.5 kW) or larger with three or more control valves or other devices by reducing the system design flow rate by not less than 50 percent or the maximum reduction allowed by the equipment manufacturer for proper operation of equipment by valves that modulate or step open and close, or pumps that modulate or turn on and off as a function of load.
3. Automatically vary pump flow on heating-water systems, chilled-water systems and heat rejection loops serving water-cooled unitary air conditioners as follows:
   3.1. Where pumps operate continuously or operate based on a time schedule, pumps with nominal output motor power of 2 hp or more shall have a variable speed drive.
   3.2. Where pumps have automatic direct digital control configured to operate pumps only when zone heating or cooling is required, a variable speed drive shall be provided for pumps with motors having the same or greater nominal output power indicated in Table C403.4.4 based on the climate zone and system served.
4. Where a variable speed drive is required by Item 3 of this section, pump motor power input shall be not more than 30 percent of design wattage at 50

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percent of the design water flow. Pump flow shall be controlled to maintain one control valve nearly wide open or to satisfy the minimum differential pressure.

Exceptions:

1. Supply-water temperature reset is not required for chilled-water systems supplied by off-site district chilled water or chilled water from ice storage systems.
2. Variable pump flow is not required on dedicated coil circulation pumps where needed for freeze protection.
3. Variable pump flow is not required on dedicated equipment circulation pumps where configured in primary/secondary design to provide the minimum flow requirements of the equipment manufacturer for proper operation of equipment.
4. Variable speed drives are not required on heating water pumps where more than 50 percent of annual heat is generated by an electric boiler.

TABLE C403.4.4
VARIABLE SPEED DRIVE (VSD) REQUIREMENTS FOR DEMAND-CONTROLLED PUMPS

CHILLED WATER AND HEAT REJECTION LOOP PUMPS IN THESE CLIMATE ZONES	HEATING WATER PUMPS IN THESE CLIMATE ZONES	VSD REQUIRED FOR MOTORS WITH RATED OUTPUT OF:
0A, 0B, 1A, 1B, 2B	—	≥ 2 hp
2A, 3B	—	≥ 3 hp
3A, 3C, 4A, 4B	7, 8	≥ 5 hp
4C, 5A, 5B, 5C, 6A, 6B	3C, 5A, 5C, 6A, 6B	≥ 7.5 hp
—	4A, 4C, 5B	≥ 10 hp
7, 8	4B	≥ 15 hp
—	2A, 2B, 3A, 3B	≥ 25 hp
—	0B, 1B	≥ 100 hp
—	0A, 1A	≥ 200 hp

For SI: 1 hp = 0.746 kW.

C403.4.5 Pump isolation. Chilled water plants including more than one chiller shall be capable of and configured to reduce flow automatically through the chiller plant when a chiller is shut down. Chillers piped in series for the purpose of increased temperature differential shall be considered as one chiller.

Boiler systems including more than one boiler shall be capable of and configured to reduce flow automatically through the boiler system when a boiler is shut down.

C403.5 Economizers. Economizers shall comply with Sections C403.5.1 through C403.5.5.

An air or water economizer shall be provided for the following cooling systems:

1. Chilled water systems with a total cooling capacity, less cooling capacity provided with air economizers, as specified in Table C403.5(1).
2. Individual fan systems with cooling capacity greater than or equal to 54,000 Btu/h (15.8 kW) in buildings having other than a *Group R* occupancy,

   The total supply capacity of all fan cooling units not provided with economizers shall not exceed 20 percent of the total supply capacity of all fan cooling units in the building or 300,000 Btu/h (88 kW), whichever is greater.
3. Individual fan systems with cooling capacity greater than or equal to 270,000 Btu/h (79.1 kW) in buildings having a *Group R* occupancy.

   The total supply capacity of all fan cooling units not provided with economizers shall not exceed 20 percent of the total supply capacity of all fan cooling units in the building or 1,500,000 Btu/h (440 kW), whichever is greater.

Exceptions: Economizers are not required for the following systems.

1. Individual fan systems not served by chilled water for buildings located in *Climate Zones* 0A, 0B, 1A and 1B.
2. Where more than 25 percent of the air designed to be supplied by the system is to spaces that are designed to be humidified above 35°F (1.7°C) dew-point temperature to satisfy process needs.
3. Systems expected to operate less than 20 hours per week.
4. Systems serving supermarket areas with open refrigerated casework.
5. Where the cooling efficiency is greater than or equal to the efficiency requirements in Table C403.5(2).
6. Systems that include a heat recovery system in accordance with Section C403.10.5.
7. VRF systems installed with a dedicated outdoor air system.

TABLE C403.5(1)
MINIMUM CHILLED-WATER SYSTEM COOLING CAPACITY FOR DETERMINING ECONOMIZER COOLING REQUIREMENTS

CLIMATE ZONES (COOLING)	TOTAL CHILLED-WATER SYSTEM CAPACITY LESS CAPACITY OF COOLING UNITS WITH AIR ECONOMIZERS	
	Local water-cooled chilled-water systems	Air-cooled chilled-water systems or district chilled-water systems
0A, 1A	Economizer not required	Economizer not required
0B, 1B, 2A, 2B	960,000 Btu/h	1,250,000 Btu/h
3A, 3B, 3C, 4A, 4B, 4C	720,000 Btu/h	940,000 Btu/h
5A, 5B, 5C, 6A, 6B, 7, 8	1,320,000 Btu/h	1,720,000 Btu/h

For SI: 1 British thermal unit per hour = 0.2931 W.

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TABLE C403.5(2)
EQUIPMENT EFFICIENCY PERFORMANCE EXCEPTION FOR ECONOMIZERS

CLIMATE ZONES	COOLING EQUIPMENT PERFORMANCE IMPROVEMENT (EER OR IPLV)
2A, 2B	10% efficiency improvement
3A, 3B	15% efficiency improvement
4A, 4B	20% efficiency improvement

C403.5.1 Integrated economizer control. Economizer systems shall be integrated with the mechanical cooling system and be configured to provide partial cooling even where additional mechanical cooling is required to provide the remainder of the cooling load. Controls shall not be capable of creating a false load in the mechanical cooling systems by limiting or disabling the economizer or any other means, such as hot gas bypass, except at the lowest stage of mechanical cooling.

Units that include an air economizer shall comply with the following:

1. Unit controls shall have the mechanical cooling capacity control interlocked with the air economizer controls such that the outdoor air damper is at the 100-percent open position when mechanical cooling is on and the outdoor air damper does not begin to close to prevent coil freezing due to minimum compressor run time until the leaving air temperature is less than 45°F (7°C).
2. Direct expansion (DX) units that control 75,000 Btu/h (22 kW) or greater of rated capacity of the capacity of the mechanical cooling directly based on occupied space temperature shall have not fewer than two stages of mechanical cooling capacity.
3. Other DX units, including those that control space temperature by modulating the airflow to the space, shall be in accordance with Table C403.5.1.

TABLE C403.5.1
DX COOLING STAGE REQUIREMENTS FOR MODULATING AIRFLOW UNITS

RATING CAPACITY	MINIMUM NUMBER OF MECHANICAL COOLING STAGES	MINIMUM COMPRESSOR DISPLACEMENT[a]
≥ 65,000 Btu/h and < 240,000 Btu/h	3 stages	≤ 35% of full load
≥ 240,000 Btu/h	4 stages	≤ 25% full load

For SI: 1 British thermal unit per hour = 0.2931 W.

a. For mechanical cooling stage control that does not use variable compressor displacement, the percent displacement shall be equivalent to the mechanical cooling capacity reduction evaluated at the full load rating conditions for the compressor.

C403.5.2 Economizer heating system impact. HVAC system design and economizer controls shall be such that economizer operation does not increase building heating energy use during normal operation.

Exception: Economizers on variable air volume (VAV) systems that cause zone level heating to increase because of a reduction in supply air temperature.

C403.5.3 Air economizers. Where economizers are required by Section C403.5, air economizers shall comply with Sections C403.5.3.1 through C403.5.3.5.

C403.5.3.1 Design capacity. Air economizer systems shall be configured to modulate *outdoor air* and return air dampers to provide up to 100 percent of the design supply air quantity as *outdoor air* for cooling.

C403.5.3.2 Control signal. Economizer controls and dampers shall be configured to sequence the dampers with the mechanical cooling equipment and shall not be controlled by only mixed-air temperature.

Exception: The use of mixed-air temperature limit control shall be permitted for systems controlled from space temperature (such as single-*zone* systems).

C403.5.3.3 High-limit shutoff. Air economizers shall be configured to automatically reduce *outdoor air* intake to the design minimum *outdoor air* quantity when *outdoor air* intake will not reduce cooling energy usage. High-limit shutoff control types for specific climates shall be chosen from Table C403.5.3.3. High-limit shutoff control settings for these control types shall be those specified in Table C403.5.3.3.

C403.5.3.4 Relief of excess outdoor air. Systems shall be capable of relieving excess *outdoor air* during air economizer operation to prevent overpressurizing the building. The relief air outlet shall be located to avoid recirculation into the building.

C403.5.3.5 Economizer dampers. Return, exhaust/relief and outdoor air dampers used in economizers shall comply with Section C403.7.7.

C403.5.4 Water-side economizers. Where economizers are required by Section C403.5, water-side economizers shall comply with Sections C403.5.4.1 and C403.5.4.2.

C403.5.4.1 Design capacity. Water economizer systems shall be configured to cool supply air by indirect evaporation and providing up to 100 percent of the expected system cooling load at *outdoor air* temperatures of not greater than 50°F (10°C) dry bulb/45°F (7°C) wet bulb.

Exceptions:

1. Systems primarily serving computer rooms in which 100 percent of the expected system cooling load at 40°F (4°C) dry bulb/35°F (1.7°C) wet bulb is met with evaporative water economizers.
2. Systems primarily serving computer rooms with dry cooler water economizers that satisfy 100 percent of the expected system cooling load at 35°F (1.7°C) dry bulb.
3. Systems where dehumidification requirements cannot be met using outdoor air temperatures of 50°F (10°C) dry bulb/45°F

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TABLE C403.5.3.3
HIGH-LIMIT SHUTOFF CONTROL SETTING FOR AIR ECONOMIZERS[b]

DEVICE TYPE	CLIMATE ZONE	REQUIRED HIGH LIMIT (ECONOMIZER OFF WHEN):	
		Equation	Description
Fixed dry bulb	0B, 1B, 2B, 3B, 3C, 4B, 4C, 5B, 5C, 6B, 7, 8	$T_{OA} > 75°F$	Outdoor air temperature exceeds 75°F
	5A, 6A	$T_{OA} > 70°F$	Outdoor air temperature exceeds 70°F
	0A, 1A, 2A, 3A, 4A	$T_{OA} > 65°F$	Outdoor air temperature exceeds 65°F
Differential dry bulb	0B, 1B, 2B, 3B, 3C, 4B, 4C, 5A, 5B, 5C, 6A, 6B, 7, 8	$T_{OA} > T_{RA}$	Outdoor air temperature exceeds return air temperature
Fixed enthalpy with fixed dry-bulb temperatures	All	$h_{OA} > 28$ Btu/lb[a] or $T_{OA} > 75°F$	Outdoor air enthalpy exceeds 28 Btu/lb of dry air[a] or Outdoor air temperature exceeds 75°F
Differential enthalpy with fixed dry-bulb temperature	All	$h_{OA} > h_{RA}$ or $T_{OA} > 75°F$	Outdoor air enthalpy exceeds return air enthalpy or Outdoor air temperature exceeds 75°F

For SI: °C = (°F – 32)/1.8, 1 Btu/lb = 2.33 kJ/kg.

a. At altitudes substantially different than sea level, the fixed enthalpy limit shall be set to the enthalpy value at 75°F and 50-percent relative humidity. As an example, at approximately 6,000 feet elevation, the fixed enthalpy limit is approximately 30.7 Btu/lb.

b. Devices with selectable setpoints shall be capable of being set to within 2°F and 2 Btu/lb of the setpoint listed.

(7°C) wet bulb and where 100 percent of the expected system cooling load at 45°F (7°C) dry bulb/40°F (4°C) wet bulb is met with evaporative water economizers.

C403.5.4.2 Maximum pressure drop. Precooling coils and water-to-water heat exchangers used as part of a water economizer system shall either have a water-side pressure drop of less than 15 feet (45 kPa) of water or a secondary loop shall be created so that the coil or heat exchanger pressure drop is not seen by the circulating pumps when the system is in the normal cooling (noneconomizer) mode.

C403.5.5 Economizer fault detection and diagnostics. Air-cooled unitary direct-expansion units listed in the tables in Section C403.3.2 and variable refrigerant flow (VRF) units that are equipped with an economizer in accordance with Sections C403.5 through C403.5.4 shall include a fault detection and diagnostics system complying with the following:

1. The following temperature sensors shall be permanently installed to monitor system operation:
   1.1. Outside air.
   1.2. Supply air.
   1.3. Return air.
2. Temperature sensors shall have an accuracy of ±2°F (1.1°C) over the range of 40°F to 80°F (4°C to 26.7°C).
3. Refrigerant pressure sensors, where used, shall have an accuracy of ±3 percent of full scale.
4. The unit controller shall be configured to provide system status by indicating the following:
   4.1. Free cooling available.
   4.2. Economizer enabled.
   4.3. Compressor enabled.
   4.4. Heating enabled.
   4.5. Mixed air low limit cycle active.
   4.6. The current value of each sensor.
5. The unit controller shall be capable of manually initiating each operating mode so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.
6. The unit shall be configured to report faults to a fault management application available for *access* by day-to-day operating or service personnel, or annunciated locally on zone thermostats.
7. The fault detection and diagnostics system shall be configured to detect the following faults:
   7.1. Air temperature sensor failure/fault.
   7.2. Not economizing when the unit should be economizing.
   7.3. Economizing when the unit should not be economizing.
   7.4. Damper not modulating.
   7.5. Excess outdoor air.

C403.6 Requirements for mechanical systems serving multiple zones. Sections C403.6.1 through C403.6.9 shall apply to mechanical systems serving multiple zones.

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C403.6.1 Variable air volume and multiple-zone systems. Supply air systems serving multiple zones shall be variable air volume (VAV) systems that have zone controls configured to reduce the volume of air that is reheated, recooled or mixed in each zone to one of the following:

1. Twenty percent of the zone design peak supply for systems with *direct digital control* (DDC) and 30 percent for other systems.
2. Systems with DDC where all of the following apply:
   2.1. The airflow rate in the deadband between heating and cooling does not exceed 20 percent of the zone design peak supply rate or higher allowed rates under Items 3, 4 and 5 of this section.
   2.2. The first stage of heating modulates the zone supply air temperature setpoint up to a maximum setpoint while the airflow is maintained at the deadband flow rate.
   2.3. The second stage of heating modulates the airflow rate from the deadband flow rate up to the heating maximum flow rate that is less than 50 percent of the zone design peak supply rate.
3. The outdoor airflow rate required to meet the minimum ventilation requirements of Chapter 4 of the *International Mechanical Code.*
4. Any higher rate that can be demonstrated to reduce overall system annual energy use by offsetting reheat/recool energy losses through a reduction in outdoor air intake for the system as approved by the code official.
5. The airflow rate required to comply with applicable codes or accreditation standards such as pressure relationships or minimum air change rates.

Exception: The following individual zones or entire air distribution systems are exempted from the requirement for VAV control:

1. *Zones* or supply air systems where not less than 75 percent of the energy for reheating or for providing warm air in mixing systems is provided from a site-recovered, including condenser heat, or site-solar energy source.
2. Systems that prevent reheating, recooling, mixing or simultaneous supply of air that has been previously cooled, either mechanically or through the use of economizer systems, and air that has been previously mechanically heated.

C403.6.2 Single-duct VAV systems, terminal devices. Single-duct VAV systems shall use terminal devices capable of and configured to reduce the supply of primary supply air before reheating or recooling takes place.

C403.6.3 Dual-duct and mixing VAV systems, terminal devices. Systems that have one warm air duct and one cool air duct shall use terminal devices that are configured to reduce the flow from one duct to a minimum before mixing of air from the other duct takes place.

C403.6.4 Single-fan dual-duct and mixing VAV systems, economizers. Individual dual-duct or mixing heating and cooling systems with a single fan and with total capacities greater than 90,000 Btu/h [(26.4 kW) 7.5 tons] shall not be equipped with air economizers.

C403.6.5 Supply-air temperature reset controls. Multiple-zone HVAC systems shall include controls that are capable of and configured to automatically reset the supply-air temperature in response to representative building loads, or to outdoor air temperature. The controls shall be configured to reset the supply air temperature not less than 25 percent of the difference between the design supply-air temperature and the design room air temperature. Controls that adjust the reset based on zone humidity are allowed in Climate Zones 0B, 1B, 2B, 3B, 3C and 4 through 8. HVAC zones that are expected to experience relatively constant loads shall have maximum airflow designed to accommodate the fully reset supply-air temperature.

Exceptions:

1. Systems that prevent reheating, recooling or mixing of heated and cooled supply air.
2. Seventy-five percent of the energy for reheating is from site-recovered or site-solar energy sources.
3. Systems in Climate Zones 0A, 1A and 3A with less than 3,000 cfm (1500 L/s) of design outside air.
4. Systems in Climate Zone 2A with less than 10,000 cfm (5000 L/s) of design outside air.
5. Systems in Climate Zones 0A, 1A, 2A and 3A with not less than 80 percent outside air and employing exhaust air energy recovery complying with Section C403.7.4.

C403.6.5.1 Dehumidification control interaction. In Climate Zones 0A, 1A, 2A and 3A, the system design shall allow supply-air temperature reset while dehumidification is provided. When dehumidification control is active, air economizers shall be locked out.

C403.6.6 Multiple-zone VAV system ventilation optimization control. Multiple-zone VAV systems with direct digital control of individual zone boxes reporting to a central control panel shall have automatic controls configured to reduce outdoor air intake flow below design rates in response to changes in system *ventilation* efficiency (E_v) as defined by the *International Mechanical Code*.

Exceptions:

1. VAV systems with zonal transfer fans that recirculate air from other zones without directly mixing it with outdoor air, dual-duct dual-fan VAV systems, and VAV systems with fan-powered terminal units.

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2. Systems where total design exhaust airflow is more than 70 percent of total design outdoor air intake flow requirements.

C403.6.7 Parallel-flow fan-powered VAV air terminal control. Parallel-flow fan-powered VAV air terminals shall have automatic controls configured to:

1. Turn off the terminal fan except when space heating is required or where required for ventilation.
2. Turn on the terminal fan as the first stage of heating before the heating coil is activated.
3. During heating for warmup or setback temperature control, either:
   3.1. Operate the terminal fan and heating coil without primary air.
   3.2. Reverse the terminal damper logic and provide heating from the central air handler by primary air.

C403.6.8 Setpoints for direct digital control. For systems with direct digital control of individual zones reporting to the central control panel, the static pressure setpoint shall be reset based on the *zone* requiring the most pressure. In such case, the setpoint is reset lower until one *zone* damper is nearly wide open. The direct digital controls shall be capable of monitoring zone damper positions or shall have an alternative method of indicating the need for static pressure that is configured to provide all of the following:

1. Automatic detection of any *zone* that excessively drives the reset logic.
2. Generation of an alarm to the system operational location.
3. Allowance for an operator to readily remove one or more *zones* from the reset algorithm.

C403.6.9 Static pressure sensor location. Static pressure sensors used to control VAV fans shall be located such that the controller setpoint is not greater than 1.2 inches w.c. (299 Pa). Where this results in one or more sensors being located downstream of major duct splits, not less than one sensor shall be located on each major branch to ensure that static pressure can be maintained in each branch.

C403.7 Ventilation and exhaust systems. In addition to other requirements of Section C403 applicable to the provision of ventilation air or the exhaust of air, ventilation and exhaust systems shall be in accordance with Sections C403.7.1 through C403.7.7.

C403.7.1 Demand control ventilation. Demand control ventilation (DCV) shall be provided for all single-zone systems required to comply with Sections C403.5 through C403.5.3 and spaces larger than 500 square feet (46.5 m^2) and with an average occupant load of 15 people or greater per 1,000 square feet (93 m^2) of floor area, as established in Table 403.3.1.1 of the *International Mechanical Code*, and served by systems with one or more of the following:

1. An air-side economizer.
2. Automatic modulating control of the outdoor air damper.
3. A design outdoor airflow greater than 3,000 cfm (1416 L/s).

Exceptions:

1. Systems with energy recovery complying with Section C403.7.4.2.
2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.
3. Multiple-zone systems with a design outdoor airflow less than 750 cfm (354 L/s).
4. Spaces where more than 75 percent of the space design outdoor airflow is required for makeup air that is exhausted from the space or transfer air that is required for makeup air that is exhausted from other spaces.
5. Spaces with one of the following occupancy classifications as defined in Table 403.3.1.1 of the *International Mechanical Code*: correctional cells, education laboratories, barber, beauty and nail salons, and bowling alley seating areas.

C403.7.2 Enclosed parking garage ventilation controls. Enclosed parking garages used for storing or handling automobiles operating under their own power shall employ carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors and automatic controls configured to stage fans or modulate fan average airflow rates to 50 percent or less of design capacity, or intermittently operate fans less than 20 percent of the occupied time or as required to maintain acceptable contaminant levels in accordance with *International Mechanical Code* provisions. Failure of contamination-sensing devices shall cause the exhaust fans to operate continuously at design airflow.

Exceptions:

1. Garages with a total exhaust capacity less than 8,000 cfm (3,755 L/s) with ventilation systems that do not utilize heating or mechanical cooling.
2. Garages that have a garage area to ventilation system motor nameplate power ratio that exceeds 1,125 cfm/hp (710 L/s/kW) and do not utilize heating or mechanical cooling.

C403.7.3 Ventilation air heating control. Units that provide ventilation air to multiple zones and operate in conjunction with zone heating and cooling systems shall not use heating or heat recovery to warm supply air to a temperature greater than 60°F (16°C) when representative

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building loads or outdoor air temperatures indicate that the majority of zones require cooling.

C403.7.4 Energy recovery systems. Energy recovery ventilation systems shall be provided as specified in either Section C403.7.4.1 or C403.7.4.2, as applicable.

C403.7.4.1 Nontransient dwelling units. Nontransient dwelling units shall be provided with outdoor air energy recovery ventilation systems with an *enthalpy recovery ratio* of not less than 50 percent at cooling design condition and not less than 60 percent at heating design condition.

Exceptions:

1. Nontransient dwelling units in Climate Zone 3C.
2. Nontransient dwelling units with not more than 500 square feet (46 m^2) of *conditioned floor area* in Climate Zones 0, 1, 2, 3, 4C and 5C.
3. *Enthalpy recovery ratio* requirements at heating design condition in Climate Zones 0, 1 and 2.
4. *Enthalpy recovery ratio* requirements at cooling design condition in Climate Zones 4, 5, 6, 7 and 8.

C403.7.4.2 Spaces other than nontransient dwelling units. Where the supply airflow rate of a fan system serving a space other than a nontransient dwelling unit exceeds the values specified in Tables C403.7.4.2(1) and C403.7.4.2(2), the system shall include an energy recovery system. The energy recovery system shall provide an *enthalpy recovery ratio* of not less than 50 percent at design conditions. Where an air economizer is required, the energy recovery system shall include a bypass or controls that permit operation of the economizer as required by Section C403.5.

Exception: An energy recovery ventilation system shall not be required in any of the following conditions:

1. Where energy recovery systems are prohibited by the *International Mechanical Code*.
2. Laboratory fume hood systems that include not fewer than one of the following features:
   2.1. Variable-air-volume hood exhaust and room supply systems configured to reduce exhaust and makeup air volume to 50 percent or less of design values.
   2.2. Direct makeup (auxiliary) air supply equal to or greater than 75 percent of the exhaust rate, heated not warmer than 2°F (1.1°C) above room setpoint, cooled to not cooler than 3°F (1.7°C) below room setpoint, with no humidification added, and no simultaneous heating and cooling used for dehumidification control.
3. Systems serving spaces that are heated to less than 60°F (15.5°C) and that are not cooled.
4. Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site-solar energy.
5. *Enthalpy recovery ratio* requirements at heating design condition in *Climate Zones* 1 and 2.
6. *Enthalpy recovery ratio* requirements at cooling design condition in *Climate Zones* 0, 3C, 4C, 5B, 5C, 6B, 7 and 8.
7. Systems requiring dehumidification that employ energy recovery in series with the cooling coil.
8. Where the largest source of air exhausted at a single location at the building exterior is less than 75 percent of the design *outdoor air* flow rate.
9. Systems expected to operate less than 20 hours per week at the *outdoor air* percentage covered by Table C403.7.4.2(1).
10. Systems exhausting toxic, flammable, paint or corrosive fumes or dust.
11. Commercial kitchen hoods used for collecting and removing grease vapors and smoke.

C403.7.5 Kitchen exhaust systems. Replacement air introduced directly into the exhaust hood cavity shall not be greater than 10 percent of the hood exhaust airflow rate. Conditioned supply air delivered to any space shall not exceed the greater of the following:

1. The ventilation rate required to meet the space heating or cooling load.
2. The hood exhaust flow minus the available transfer air from adjacent space where available transfer air is considered to be that portion of outdoor ventilation air not required to satisfy other exhaust needs, such as restrooms, and not required to maintain pressurization of adjacent spaces.

Where total kitchen hood exhaust airflow rate is greater than 5,000 cfm (2360 L/s), each hood shall be a factory-built commercial exhaust hood listed by a nationally recognized testing laboratory in compliance with UL 710. Each hood shall have a maximum exhaust rate as specified in Table C403.7.5 and shall comply with one of the following:

1. Not less than 50 percent of all replacement air shall be transfer air that would otherwise be exhausted.
2. Demand ventilation systems on not less than 75 percent of the exhaust air that are configured to provide not less than a 50-percent reduction in

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exhaust and replacement air system airflow rates, including controls necessary to modulate airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and idle.

3. Listed energy recovery devices with a sensible heat recovery effectiveness of not less than 40 percent on not less than 50 percent of the total exhaust airflow.

Where a single hood, or hood section, is installed over appliances with different duty ratings, the maximum allowable flow rate for the hood or hood section shall be based on the requirements for the highest appliance duty rating under the hood or hood section.

Exception: Where not less than 75 percent of all the replacement air is transfer air that would otherwise be exhausted.

TABLE C403.7.4.2(1)
ENERGY RECOVERY REQUIREMENT (Ventilation systems operating less than 8,000 hours per year)

CLIMATE ZONE	PERCENT (%) OUTDOOR AIR AT FULL DESIGN AIRFLOW RATE							
	≥ 10% and < 20%	≥ 20% and < 30%	≥ 30% and < 40%	≥ 40% and < 50%	≥ 50% and < 60%	≥ 60% and < 70%	≥ 70% and < 80%	≥ 80%
	Design Supply Fan Airflow Rate (cfm)							
3B, 3C, 4B, 4C, 5B	NR	NR	NR	NR	NR	NR	NR	NR
0B, 1B, 2B, 5C	NR	NR	NR	NR	≥ 26,000	≥ 12,000	≥ 5,000	≥ 4,000
6B	≥ 28,000	≥ 26,5000	≥ 11,000	≥ 5,500	≥ 4,500	≥ 3,500	≥ 2,500	≥ 1,500
0A, 1A, 2A, 3A, 4A, 5A, 6A	≥ 26,000	≥ 16,000	≥ 5,500	≥ 4,500	≥ 3,500	≥ 2,000	≥ 1,000	> 120
7, 8	≥ 4,500	≥ 4,000	≥ 2,500	≥ 1,000	> 140	> 120	> 100	> 80

For SI: 1 cfm = 0.4719 L/s.
NR = Not Required.

TABLE C403.7.4.2(2)
ENERGY RECOVERY REQUIREMENT (Ventilation systems operating not less than 8,000 hours per year)

CLIMATE ZONE	PERCENT (%) OUTDOOR AIR AT FULL DESIGN AIRFLOW RATE							
	≥ 10% and < 20%	≥ 20% and < 30%	≥ 30% and < 40%	≥ 40% and < 50%	≥ 50% and < 60%	≥ 60% and < 70%	≥ 70% and < 80%	≥ 80%
	Design Supply Fan Airflow Rate (cfm)							
3C	NR	NR	NR	NR	NR	NR	NR	NR
0B, 1B, 2B, 3B, 4C, 5C	NR	≥ 19,500	≥ 9,000	≥ 5,000	≥ 4,000	≥ 3,000	≥ 1,500	≥ 120
0A, 1A, 2A, 3A, 4B, 5B	≥ 2,500	≥ 2,000	≥ 1,000	≥ 500	≥ 140	≥ 120	≥ 100	≥ 80
4A, 5A, 6A, 6B, 7, 8	≥ 200	≥ 130	≥ 100	≥ 80	≥ 70	≥ 60	≥ 50	≥ 40

For SI: 1 cfm = 0.4719 L/s.
NR = Not Required.

TABLE C403.7.5
MAXIMUM NET EXHAUST FLOW RATE, CFM PER LINEAR FOOT OF HOOD LENGTH

TYPE OF HOOD	LIGHT-DUTY EQUIPMENT	MEDIUM-DUTY EQUIPMENT	HEAVY-DUTY EQUIPMENT	EXTRA-HEAVY-DUTY EQUIPMENT
Wall-mounted canopy	140	210	280	385
Single island	280	350	420	490
Double island (per side)	175	210	280	385
Eyebrow	175	175	NA	NA
Backshelf/Pass-over	210	210	280	NA

For SI: 1 cfm = 0.4719 L/s; 1 foot = 304.8 mm.
NA = Not Allowed.

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C403.7.6 Automatic control of HVAC systems serving guestrooms. In Group R-1 buildings containing more than 50 guestrooms, each guestroom shall be provided with controls complying with the provisions of Sections C403.7.6.1 and C403.7.6.2. Card key controls comply with these requirements.

C403.7.6.1 Temperature setpoint controls. Controls shall be provided on each HVAC system that are capable of and configured with three modes of temperature control.

1. When the guestroom is rented but unoccupied, the controls shall automatically raise the cooling setpoint and lower the heating setpoint by not less than 4°F (2°C) from the occupant setpoint within 30 minutes after the occupants have left the guestroom.
2. When the guestroom is unrented and unoccupied, the controls shall automatically raise the cooling setpoint to not lower than 80°F (27°C) and lower the heating setpoint to not higher than 60°F (16°C). Unrented and unoccupied guestroom mode shall be initiated within 16 hours of the guestroom being continuously occupied or where a *networked guestroom control system* indicates that the guestroom is unrented and the guestroom is unoccupied for more than 20 minutes. A *networked guestroom control system* that is capable of returning the thermostat setpoints to default occupied setpoints 60 minutes prior to the time a guestroom is scheduled to be occupied is not precluded by this section. Cooling that is capable of limiting relative humidity with a setpoint not lower than 65-percent relative humidity during unoccupied periods is not precluded by this section.
3. When the guestroom is occupied, HVAC setpoints shall return to their occupied setpoints once occupancy is sensed.

C403.7.6.2 Ventilation controls. Controls shall be provided on each HVAC system that are capable of and configured to automatically turn off the ventilation and exhaust fans within 20 minutes of the occupants leaving the guestroom, or *isolation devices* shall be provided to each guestroom that are capable of automatically shutting off the supply of outdoor air to and exhaust air from the guestroom.

Exception: Guestroom ventilation systems are not precluded from having an automatic daily pre-occupancy purge cycle that provides daily outdoor air ventilation during unrented periods at the design ventilation rate for 60 minutes, or at a rate and duration equivalent to one air change.

C403.7.7 Shutoff dampers. Outdoor air intake and exhaust openings and stairway and shaft vents shall be provided with Class I motorized dampers. The dampers shall have an air leakage rate not greater than 4 cfm/ft^2 (20.3 L/s × m^2) of damper surface area at 1.0 inch water gauge (249 Pa) and shall be labeled by an *approved agency* when tested in accordance with AMCA 500D for such purpose.

Outdoor air intake and exhaust dampers shall be installed with automatic controls configured to close when the systems or spaces served are not in use or during unoccupied period warm-up and setback operation, unless the systems served require outdoor or exhaust air in accordance with the *International Mechanical Code* or the dampers are opened to provide intentional economizer cooling.

Stairway and shaft vent dampers shall be installed with automatic controls configured to open upon the activation of any fire alarm initiating device of the building's fire alarm system or the interruption of power to the damper.

Exception: Nonmotorized gravity dampers shall be an alternative to motorized dampers for exhaust and relief openings as follows:

1. In buildings less than three stories in height above grade plane.
2. In buildings of any height located in *Climate Zones* 0, 1, 2 or 3.
3. Where the design exhaust capacity is not greater than 300 cfm (142 L/s).

Nonmotorized gravity dampers shall have an air leakage rate not greater than 20 cfm/ft^2 (101.6 L/s × m^2) where not less than 24 inches (610 mm) in either dimension and 40 cfm/ft^2 (203.2 L/s × m^2) where less than 24 inches (610 mm) in either dimension. The rate of air leakage shall be determined at 1.0 inch water gauge (249 Pa) when tested in accordance with AMCA 500D for such purpose. The dampers shall be labeled by an *approved agency*.

C403.8 Fans and fan controls. Fans in HVAC systems shall comply with Sections C403.8.1 through C403.8.6.1.

C403.8.1 Allowable fan horsepower. Each HVAC system having a total fan system motor nameplate horsepower exceeding 5 hp (3.7 kW) at fan system design conditions shall not exceed the allowable *fan system motor nameplate hp* (Option 1) or *fan system bhp* (Option 2) shown in Table C403.8.1(1). This includes supply fans, exhaust fans, return/relief fans, and fan-powered terminal units associated with systems providing heating or cooling capability. Single-zone variable air volume systems shall comply with the constant volume fan power limitation.

Exceptions:

1. Hospital, vivarium and laboratory systems that utilize flow control devices on exhaust or return to maintain space pressure relationships necessary for occupant health and safety or environmental control shall be permitted to use variable volume fan power limitation.
2. Individual exhaust fans with motor nameplate horsepower of 1 hp (0.746 kW) or less are

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exempt from the allowable fan horsepower requirement.

C403.8.2 Motor nameplate horsepower. For each fan, the fan brake horsepower (bhp) shall be indicated on the construction documents and the selected motor shall be not larger than the first available motor size greater than the following:

1. For fans less than 6 bhp (4476 W), 1.5 times the fan brake horsepower.
2. For fans 6 bhp (4476 W) and larger, 1.3 times the fan brake horsepower.

Exceptions:

1. Fans equipped with electronic speed control devices to vary the fan airflow as a function of load.
2. Fans with a fan nameplate electrical input power of less than 0.89 kW.

TABLE C403.8.1(1)
FAN POWER LIMITATION

	LIMIT	CONSTANT VOLUME	VARIABLE VOLUME
Option 1: Fan system motor nameplate hp	Allowable nameplate motor hp	$hp \le CFM_S \times 0.0011$	$hp \le CFM_S \times 0.0015$
Option 2: Fan system bhp	Allowable fan system bhp	$bhp \le CFM_S \times 0.00094 + A$	$bhp \le CFM_S \times 0.0013 + A$

For SI: 1 bhp = 735.5 W, 1 hp = 745.5 W, 1 cfm = 0.4719 L/s.
where:
CFM_S = The maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute.
hp = The maximum combined motor nameplate horsepower.
bhp = The maximum combined fan brake horsepower.
A = Sum of $[PD \times CFM_D / 4131]$.
where:
PD = Each applicable pressure drop adjustment from Table C403.8.1(2) in. w.c.
CFM_D = The design airflow through each applicable device from Table C403.8.1(2) in cubic feet per minute.

TABLE C403.8.1(2)
FAN POWER LIMITATION PRESSURE DROP ADJUSTMENT

DEVICE	ADJUSTMENT
Credits	
Return air or exhaust systems required by code or accreditation standards to be fully ducted, or systems required to maintain air pressure differentials between adjacent rooms	0.5 inch w.c. (2.15 inches w.c. for laboratory and vivarium systems)
Return and exhaust airflow control devices	0.5 inch w.c.
Exhaust filters, scrubbers or other exhaust treatment	The pressure drop of device calculated at fan system design condition
Particulate filtration credit: MERV 9 thru 12	0.5 inch w.c.
Particulate filtration credit: MERV 13 thru 15	0.9 inch w.c.
Particulate filtration credit: MERV 16 and greater and electronically enhanced filters	Pressure drop calculated at 2 times the clean filter pressure drop at fan system design condition.
Carbon and other gas-phase air cleaners	Clean filter pressure drop at fan system design condition.
Biosafety cabinet	Pressure drop of device at fan system design condition.
Energy recovery device, other than coil runaround loop	For each airstream, (2.2 × energy recovery effectiveness - 0.5) inch w.c.
Coil runaround loop	0.6 inch w.c. for each airstream.
Evaporative humidifier/cooler in series with another cooling coil	Pressure drop of device at fan system design conditions.
Sound attenuation section (fans serving spaces with design background noise goals below NC35)	0.15 inch w.c.
Exhaust system serving fume hoods	0.35 inch w.c.
Laboratory and vivarium exhaust systems in high-rise buildings	0.25 inch w.c./100 feet of vertical duct exceeding 75 feet.
Deductions	
Systems without central cooling device	- 0.6 inch w.c.
Systems without central heating device	- 0.3 inch w.c.
Systems with central electric resistance heat	- 0.2 inch w.c.

For SI: 1 inch w.c. = 249 Pa, 1 inch = 25.4 mm, 1 foot = 304.8 mm.
w.c. = Water Column, NC = Noise Criterion.

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3. Systems complying with Section C403.8.1 fan system motor nameplate hp (Option 1).
4. Fans with motor nameplate horsepower less than 1 hp (746 W).

C403.8.3 Fan efficiency. Each fan and fan array shall have a fan energy index (FEI) of not less than 1.00 at the design point of operation, as determined in accordance with AMCA 208 by an *approved* independent testing laboratory and labeled by the manufacturer. Each fan and fan array used for a variable-air-volume system shall have an FEI of not less than 0.95 at the design point of operation, as determined in accordance with AMCA 208 by an approved independent testing laboratory and labeled by the manufacturer. The FEI for fan arrays shall be calculated in accordance with AMCA 208 Annex C.

Exceptions: The following fans are not required to have a fan energy index:

1. Fans that are not embedded fans with motor nameplate horsepower of less than 1.0 hp (0.75 kW) or with a nameplate electrical input power of less than 0.89 kW.
2. Embedded fans that have a motor nameplate horsepower of 5 hp (3.7 kW) or less, or with a fan system electrical input power of 4.1 kW or less.
3. Multiple fans operated in series or parallel as the functional equivalent of a single fan that have a combined motor nameplate horsepower of 5 hp (3.7 kW) or less or with a fan system electrical input power of 4.1 kW or less.
4. Fans that are part of equipment covered in Section C403.3.2.
5. Fans included in an equipment package certified by an *approved agency* for air or energy performance.
6. Ceiling fans, which are defined as nonportable devices suspended from a ceiling or overhead structure for circulating air via the rotation of the blades.
7. Fans used for moving gases at temperatures above 482°F (250°C).
8. Fans used for operation in explosive atmospheres.
9. Reversible fans used for tunnel ventilation.
10. Fans that are intended to operate only during emergency conditions.
11. Fans outside the scope of AMCA 208.

C403.8.4 Fractional hp fan motors. Motors for fans that are not less than $^{1}/_{12}$ hp (0.062 kW) and less than 1 hp (0.746 kW) shall be electronically commutated motors or shall have a minimum motor efficiency of 70 percent, rated in accordance with DOE 10 CFR 431. These motors shall have the means to adjust motor speed for either balancing or remote control. The use of belt-driven fans to sheave adjustments for airflow balancing instead of a varying motor speed shall be permitted.

Exceptions: The following motors are not required to comply with this section

1. Motors in the airstream within fan coils and terminal units that only provide heating to the space served.
2. Motors in space-conditioning equipment that comply with Section C403.3.2 or Sections C403.8.1. through C403.8.3.
3. Motors that comply with Section C405.8.

C403.8.5 Low-capacity ventilation fans. Mechanical ventilation system fans with motors less than $^{1}/_{12}$ hp (0.062 kW) in capacity shall meet the efficacy requirements of Table C403.8.5 at one or more rating points.

Exceptions:

1. Where ventilation fans are a component of a listed heating or cooling appliance.
2. Dryer exhaust duct power ventilators, domestic range hoods and domestic range booster fans that operate intermittently.

TABLE C403.8.5
LOW-CAPACITY VENTILATION FAN EFFICACY[a]

FAN LOCATION	AIRFLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIRFLOW RATE MAXIMUM (CFM)
HRV or ERV	Any	1.2 cfm/watt	Any
In-line fan	Any	3.8 cfm/watt	Any
Bathroom, utility room	10	2.8 cfm/watt	< 90
Bathroom, utility room	90	3.5 cfm/watt	Any

For SI: 1 cfm/ft = 47.82 W.

a. Airflow shall be tested in accordance with HVI 916 and listed. Efficacy shall be listed or shall be derived from listed power and airflow. Fan efficacy for fully ducted HRV, ERV, balanced and in-line fans shall be determined at a static pressure not less than 0.2 inch w.c. Fan efficacy for ducted range hoods, bathroom and utility room fans shall be determined at a static pressure not less than 0.1 inch w.c.

C403.8.6 Fan control. Controls shall be provided for fans in accordance with Section C403.8.6.1 and as required for specific systems provided in Section C403.

C403.8.6.1 Fan airflow control. Each cooling system listed in Table C403.8.6.1 shall be designed to vary the indoor fan airflow as a function of load and shall comply with the following requirements:

1. Direct expansion (DX) and chilled water cooling units that control the capacity of the mechanical cooling directly based on space temperature shall have not fewer than two stages of fan control. Low or minimum speed shall not be greater than 66 percent of full speed. At low or minimum speed, the fan system shall draw not more than 40 percent of

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the fan power at full fan speed. Low or minimum speed shall be used during periods of low cooling load and ventilation-only operation.

2. Other units including DX cooling units and chilled water units that control the space temperature by modulating the airflow to the space shall have modulating fan control. Minimum speed shall be not greater than 50 percent of full speed. At minimum speed the fan system shall draw not more than 30 percent of the power at full fan speed. Low or minimum speed shall be used during periods of low cooling load and ventilation-only operation.
3. Units that include an air-side economizer in accordance with Section C403.5 shall have not fewer than two speeds of fan control during economizer operation.

Exceptions:

1. Modulating fan control is not required for chilled water and evaporative cooling units with fan motors of less than 1 hp (0.746 kW) where the units are not used to provide *ventilation air* and the indoor fan cycles with the load.
2. Where the volume of outdoor air required to comply with the ventilation requirements of the *International Mechanical Code* at low speed exceeds the air that would be delivered at the speed defined in Section C403.8.6, the minimum speed shall be selected to provide the required *ventilation air*.

TABLE C403.8.6.1
COOLING SYSTEMS

COOLING SYSTEM TYPE	FAN MOTOR SIZE	MECHANICAL COOLING CAPACITY
DX cooling	Any	≥ 65,000 Btu/h
Chilled water and evaporative cooling	≥ 1/4 hp	Any

For SI: 1 British thermal unit per hour = 0.2931 W; 1 hp = 0.746 kW.

C403.9 Large-diameter ceiling fans. Where provided, *large-diameter ceiling fans* shall be tested and labeled in accordance with AMCA 230.

C403.10 Heat rejection equipment. Heat rejection equipment, including air-cooled condensers, dry coolers, open-circuit cooling towers, closed-circuit cooling towers and evaporative condensers, shall comply with this section.

Exception: Heat rejection devices where energy usage is included in the equipment efficiency ratings listed in Tables C403.3.2(6) and C403.3.2(7).

C403.10.1 Fan speed control. Each fan system powered by an individual motor or array of motors with connected power, including the motor service factor, totaling 5 hp (3.7 kW) or more shall have controls and devices configured to automatically modulate the fan speed to control the leaving fluid temperature or condensing temperature and pressure of the heat rejection device. Fan motor power input shall be not more than 30 percent of design wattage at 50 percent of the design airflow.

Exceptions:

1. Fans serving multiple refrigerant or fluid cooling circuits.
2. Condenser fans serving flooded condensers.

C403.10.2 Multiple-cell heat rejection equipment. Multiple-cell heat rejection equipment with variable speed fan drives shall be controlled to operate the maximum number of fans allowed that comply with the manufacturer's requirements for all system components and so that all fans operate at the same fan speed required for the instantaneous cooling duty, as opposed to staged on and off operation. The minimum fan speed shall be the minimum allowable speed of the fan drive system in accordance with the manufacturer's recommendations.

C403.10.3 Limitation on centrifugal fan open-circuit cooling towers. Centrifugal fan open-circuit cooling towers with a combined rated capacity of 1,100 gpm (4164 L/m) or greater at 95°F (35°C) condenser water return, 85°F (29°C) condenser water supply, and 75°F (24°C) outdoor air wet-bulb temperature shall meet the energy efficiency requirement for axial fan open-circuit cooling towers listed in Table C403.3.2(8).

Exception: Centrifugal open-circuit cooling towers that are designed with inlet or discharge ducts or require external sound attenuation.

C403.10.4 Tower flow turndown. Open-circuit cooling towers used on water-cooled chiller systems that are configured with multiple- or variable-speed condenser water pumps shall be designed so that all open-circuit cooling tower cells can be run in parallel with the larger of the flow that is produced by the smallest pump at its minimum expected flow rate or at 50 percent of the design flow for the cell.

C403.10.5 Heat recovery for service water heating. Condenser heat recovery shall be installed for heating or reheating of service hot water provided that the facility operates 24 hours a day, the total installed heat capacity of water-cooled systems exceeds 6,000,000 Btu/hr (1758 kW) of heat rejection, and the design service water heating load exceeds 1,000,000 Btu/h (293 kW).

The required heat recovery system shall have the capacity to provide the smaller of the following:

1. Sixty percent of the peak heat rejection load at design conditions.
2. The preheating required to raise the peak service hot water draw to 85°F (29°C).

Exceptions:

1. Facilities that employ condenser heat recovery for space heating or reheat purposes with a heat recovery design exceeding 30 percent of the peak water-cooled condenser load at design conditions.

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2. Facilities that provide 60 percent of their service water heating from site solar or site recovered energy or from other sources.

C403.10.6 Heat recovery for space conditioning in healthcare facilities. Where heating water is used for space heating, a condenser heat recovery system shall be installed provided that all of the following are true:

1. The building is a Group I-2, Condition 2 occupancy.
2. The total design chilled water capacity for the Group I-2,Condition 2 occupancy, either air cooled or water cooled, required at cooling design conditions exceeds 3,600,000 Btu/h (1100 kw) of cooling.
3. Simultaneous heating and cooling occurs above 60°F (16°C) outdoor air temperature.

The required heat recovery system shall have a cooling capacity that is not less than 7 percent of the total design chilled water capacity of the Group I-2, Condition 2 occupancy at peak design conditions.

Exceptions:

1. Buildings that provide 60 percent or more of their reheat energy from on-site renewable energy or site-recovered energy.
2. Buildings in Climate Zones 5C, 6B, 7 and 8.

C403.11 Refrigeration equipment performance. Refrigeration equipment performance shall be determined in accordance with Sections C403.11.1 and C403.11.2 for commercial refrigerators, freezers, refrigerator-freezers, walk-in coolers, walk-in freezers and refrigeration equipment. The energy use shall be verified through certification under an *approved* certification program or, where a certification program does not exist, the energy use shall be supported by data furnished by the equipment manufacturer.

Exception: Walk-in coolers and walk-in freezers regulated under federal law in accordance with Subpart R of DOE 10 CFR 431.

C403.11.1 Commercial refrigerators, refrigerator-freezers and refrigeration. Refrigeration equipment, defined in DOE 10 CFR Part 431.62, shall have an energy use in kWh/day not greater than the values of Table C403.11.1 when tested and rated in accordance with AHRI Standard 1200.

C403.11.2 Walk-in coolers and walk-in freezers. Walk-in cooler and walk-in freezer refrigeration systems, except for walk-in process cooling refrigeration systems as defined in DOE 10 CFR 431.302, shall meet the requirements of Tables C403.11.2.1(1), C403.11.2.1(2) and C403.11.2.1(3).

C403.11.2.1 Performance standards. *Walk-in coolers* and *walk-in freezers* shall meet the requirements of Tables C403.11.2.1(1), C403.11.2.1(2) and C403.11.2.1(3).

TABLE C403.11.2.1(1)
WALK-IN COOLER AND FREEZER DISPLAY DOOR EFFICIENCY REQUIREMENTS[a]

CLASS DESCRIPTOR	CLASS	MAXIMUM ENERGY CONSUMPTION (kWh/day)[a]
Display door, medium temperature	DD, M	$0.04 \times A_{dd} + 0.41$
Display door, low temperature	DD, L	$0.15 \times A_{dd} + 0.29$

a. A_{dd} is the surface area of the display door.

TABLE C403.11.2.1(2)
WALK-IN COOLER AND FREEZER NONDISPLAY DOOR EFFICIENCY REQUIREMENTS[a]

CLASS DESCRIPTOR	CLASS	MAXIMUM ENERGY CONSUMPTION (kWh/day)[a]
Passage door, medium temperature	PD, M	$0.05 \times A_{nd} + 1.7$
Passage door, low temperature	PD, L	$0.14 \times A_{nd} + 4.8$
Freight door, medium temperature	FD, M	$0.04 \times A_{nd} + 1.9$
Freight door, low temperature	FD, L	$0.12 \times A_{nd} + 5.6$

a. A_{nd} is the surface area of the nondisplay door.

C403.11.3 Refrigeration systems. Refrigerated display cases, *walk-in coolers* or *walk-in freezers* that are served by remote compressors and remote condensers not located in a condensing unit, shall comply with Sections C403.11.3.1 and C403.11.3.2.

Exception: Systems where the working fluid in the refrigeration cycle goes through both subcritical and super-critical states (transcritical) or that use ammonia refrigerant are exempt.

C403.11.3.1 Condensers serving refrigeration systems. Fan-powered condensers shall comply with the following:

1. The design *saturated condensing temperatures* for air-cooled condensers shall not exceed the design dry-bulb temperature plus 10°F (5.6°C) for low-*temperature refrigeration systems*, and the design dry-bulb temperature plus 15°F (8°C) for *medium temperature refrigeration systems* where the *saturated condensing temperature* for blend refrigerants shall be determined using the average of liquid and vapor temperatures as converted from the condenser drain pressure.
2. Condenser fan motors that are less than 1 hp (0.75 kW) shall use electronically commutated motors, permanent split-capacitor-type motors or 3-phase motors.
3. Condenser fans for air-cooled condensers, evaporatively cooled condensers, air- or water-cooled fluid coolers or cooling towers shall

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reduce fan motor demand to not more than 30 percent of design wattage at 50 percent of design air volume, and incorporate one of the following continuous variable speed fan control approaches:

3.1. Refrigeration system condenser control for air-cooled condensers shall use variable setpoint control logic to reset the condensing temperature setpoint in response to ambient dry-bulb temperature.

3.2. Refrigeration system condenser control for evaporatively cooled condensers shall use variable setpoint control logic to reset the condensing temperature setpoint in response to ambient wet-bulb temperature.

4. Multiple fan condensers shall be controlled in unison.

5. The minimum condensing temperature setpoint shall be not greater than 70°F (21°C).

C403.11.3.2 Compressor systems. Refrigeration compressor systems shall comply with the following:

1. Compressors and multiple-compressor system suction groups shall include control systems that use floating suction pressure control logic to reset the target suction pressure temperature based on the temperature requirements of the attached refrigeration display cases or walk-ins.

   Exception: Controls are not required for the following:

   1. Single-compressor systems that do not have variable capacity capability.

   2. Suction groups that have a design saturated suction temperature of 30°F (-1.1°C) or higher, suction groups that comprise the high stage of a two-stage or cascade system, or suction groups that primarily serve chillers for secondary cooling fluids.

2. Liquid subcooling shall be provided for all low-temperature compressor systems with a design cooling capacity equal to or greater than 100,000 Btu (29.3 kW) with a design-saturated suction temperature of -10°F (-23°C) or lower. The sub-cooled liquid temperature shall be controlled at a maximum temperature setpoint of 50°F (10°C) at the exit of the subcooler using either compressor economizer (inter-stage) ports or a separate compressor suction group operating at a saturated suction temperature of 18°F (-7.8°C) or higher.

   2.1. Insulation for liquid lines with a fluid operating temperature less than 60°F (15.6°C) shall comply with Table C403.11.3.

3. Compressors that incorporate internal or external crankcase heaters shall provide a means to cycle the heaters off during compressor operation.

C403.12 Construction of HVAC system elements. Ducts, plenums, piping and other elements that are part of an HVAC system shall be constructed and insulated in accordance with Sections C403.12.1 through C403.12.3.1.

TABLE C403.11.2.1(3)
WALK-IN COOLER AND FREEZER REFRIGERATION SYSTEM EFFICIENCY REQUIREMENTS

CLASS DESCRIPTOR	CLASS	MINIMUM ANNUAL WALK-IN ENERGY FACTOR AWEF (Btu/W-h)[a]	TEST PROCEDURE
Dedicated condensing, medium temperature, indoor system	DC.M.I	5.61	AHRI 1250
Dedicated condensing, medium temperature, outdoor system	DC.M.O	7.60	
Dedicated condensing, low temperature, indoor system, net capacity (q_{net}) < 6,500 Btu/h	DC.L.I, < 6,500	$9.091 \times 10^{-5} \times q_{net} + 1.81$	
Dedicated condensing, low temperature, indoor system, net capacity (q_{net}) ≥ 6,500 Btu/h	DC.L.I, ≥ 6,500	2.40	
Dedicated condensing, low temperature, outdoor system, net capacity (q_{net}) < 6,500 Btu/h	DC.L.O, < 6,500	$6.522 \times 10^{-5} \times q_{net} + 2.73$	
Dedicated condensing, low temperature, outdoor system, net capacity (q_{net}) ≥ 6,500 Btu/h	DC.L.O, ≥ 6,500	3.15	
Unit cooler, medium	UC.M	9.00	
Unit cooler, low temperature, net capacity (q_{net}) < 15,500 Btu/h	UC.L, < 15,500	$1.575 \times 10^{-5} \times q_{net} + 3.91$	
Unit cooler, low temperature, net capacity (q_{net}) ≥ 15,500 Btu/h	UC.L, ≥ 15,500	4.15	

For SI: 1 British thermal unit per hour = 0.2931 W.

a. q_{net} is net capacity (Btu/h) as determined in accordance with AHRI 1250.

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TABLE C403.11.1
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL REFRIGERATORS AND FREEZERS AND REFRIGERATION

EQUIPMENT CATEGORY	CONDENSING UNIT CONFIGURATION	EQUIPMENT FAMILY	RATING TEMP., °F	OPERATING TEMP., °F	EQUIPMENT CLASSIFICATION[a, c]	MAXIMUM DAILY ENERGY CONSUMPTION, kWh/day[d, e]	TEST STANDARD
Remote condensing commercial refrigerators and commercial freezers	Remote (RC)	Vertical open (VOP)	38 (M)	≥ 32	VOP.RC.M	0.64 × TDA + 4.07	AHRI 1200
			0 (L)	< 32	VOP.RC.L	2.20 × TDA + 6.85	
		Semivertical open (SVO)	38 (M)	≥ 32	SVO.RC.M	0.66 × TDA + 3.18	
			0 (L)	< 32	SVO.RC.L	2.20 × TDA + 6.85	
		Horizontal open (HZO)	38 (M)	≥ 32	HZO.RC.M	0.35 × TDA + 2.88	
			0 (L)	< 32	HZO.RC.L	0.55 × TDA + 6.88	
		Vertical closed transparent (VCT)	38 (M)	≥ 32	VCT.RC.M	0.15 × TDA + 1.95	
			0 (L)	< 32	VCT.RC.L	0.49 × TDA + 2.61	
		Horizontal closed transparent (HCT)	38 (M)	≥ 32	HCT.RC.M	0.16 × TDA + 0.13	
			0 (L)	< 32	HCT.RC.L	0.34 × TDA + 0.26	
		Vertical closed solid (VCS)	38 (M)	≥ 32	VCS.RC.M	0.10 × V + 0.26	
			0 (L)	< 32	VCS.RC.L	0.21 × V + 0.54	
		Horizontal closed solid (HCS)	38 (M)	≥ 32	HCS.RC.M	0.10 × V + 0.26	
			0 (L)	< 32	HCS.RC.L	0.21 × V + 0.54	
		Service over counter (SOC)	38 (M)	≥ 32	SOC.RC.M	0.44 × TDA + 0.11	
			0 (L)	< 32	SOC.RC.L	0.93 × TDA + 0.22	
Self-contained commercial refrigerators and commercial freezers with and without doors	Self-contained (SC)	Vertical open (VOP)	38 (M)	≥ 32	VOP.SC.M	1.69 × TDA + 4.71	AHRI 1200
			0 (L)	< 32	VOP.SC.L	4.25 × TDA + 11.82	
		Semivertical open (SVO)	38 (M)	≥ 32	SVO.SC.M	1.70 × TDA + 4.59	
			0 (L)	< 32	SVO.SC.L	4.26 × TDA + 11.51	
		Horizontal open (HZO)	38 (M)	≥ 32	HZO.SC.M	0.72 × TDA + 5.55	
			0 (L)	< 32	HZO.RC.L	1.90 × TDA + 7.08	
		Vertical closed transparent (VCT)	38 (M)	≥ 32	VCT.SC.M	0.10 × V + 0.86	
			0 (L)	< 32	VCT.SC.L	0.29 × V + 2.95	
		Vertical closed solid (VCS)	38 (M)	≥ 32	VCS.SC.M	0.05 × V + 1.36	
			0 (L)	< 32	VCS.SC.L	0.22 × V + 1.38	
		Horizontal closed transparent (HCT)	38 (M)	≥ 32	HCT.SC.M	0.06 × V + 0.37	
			0 (L)	< 32	HCT.SC.L	0.08 × V + 1.23	
		Horizontal closed solid (HCS)	38 (M)	≥ 32	HCS.SC.M	0.05 × V + 0.91	
			0 (L)	< 32	HCS.SC.L	0.06 × V + 1.12	
		Service over counter (SOC)	38 (M)	≥ 32	SOC.SC.M	0.52 × TDA + 1.00	
			0 (L)	< 32	SOC.SC.L	1.10 × TDA + 2.10	

(continued)

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TABLE C403.11.1—continued
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL REFRIGERATORS AND FREEZERS AND REFRIGERATION

EQUIPMENT CATEGORY	CONDENSING UNIT CONFIGURATION	EQUIPMENT FAMILY	RATING TEMP., °F	OPERATING TEMP., °F	EQUIPMENT CLASSIFICATION[a, c]	MAXIMUM DAILY ENERGY CONSUMPTION, kWh/day[d, e]	TEST STANDARD
Self-contained commercial refrigerators with transparent doors for pull-down temperature applications	Self-contained (SC)	Pull-down (PD)	38 (M)	≥ 32	PD.SC.M	0.11 × V + 0.81	AHRI 1200
Commercial ice cream freezers	Remote (RC)	Vertical open (VOP)	-15 (I)	≤ -5[b]	VOP.RC.I	2.79 × TDA + 8.70	AHRI 1200
		Semivertical open (SVO)			SVO.RC.I	2.79 × TDA + 8.70	
		Horizontal open (HZO)			HZO.RC.I	0.70 × TDA + 8.74	
		Vertical closed transparent (VCT)			VCT.RC.I	0.58 × TDA + 3.05	
		Horizontal closed transparent (HCT)			HCT.RC.I	0.40 × TDA + 0.31	
		Vertical closed solid (VCS)			VCS.RC.I	0.25 × V + 0.63	
		Horizontal closed solid (HCS)			HCS.RC.I	0.25 × V + 0.63	
		Service over counter (SOC)			SOC.RC.I	1.09 × TDA + 0.26	
	Self-contained (SC)	Vertical open (VOP)			VOP.SC.I	5.40 × TDA + 15.02	AHRI 1200
		Semivertical open (SVO)			SVO.SC.I	5.41 × TDA + 14.63	
		Horizontal open (HZO)			HZO.SC.I	2.42 × TDA + 9.00	
		Vertical closed transparent (VCT)			VCT.SC.I	0.62 × TDA + 3.29	
		Horizontal closed transparent (HCT)			HCT.SC.I	0.56 × TDA + 0.43	
		Vertical closed solid (VCS)			VCS.SC.I	0.34 × V + 0.88	
		Horizontal closed solid (HCS)			HCS.SC.I	0.34 × V + 0.88	
		Service over counter (SOC)			SOC.SC.I	1.53 × TDA + 0.36	

For SI: 1 square foot = 0.0929 m^2, 1 cubic foot = 0.02832 m^3, °C = (°F – 32)/1.8.

a. The meaning of the letters in this column is indicated in the columns to the left.

b. Ice cream freezer is defined in DOE 10 CFR 431.62 as a commercial freezer that is designed to operate at or below -5 °F and that the manufacturer designs, markets or intends for the storing, displaying or dispensing of ice cream.

c. Equipment class designations consist of a combination [in sequential order separated by periods (AAA).(BB).(C)] of the following:
- (AAA)—An equipment family code (VOP = vertical open, SVO = semivertical open, HZO = horizontal open, VCT = vertical closed transparent doors, VCS = vertical closed solid doors, HCT = horizontal closed transparent doors, HCS = horizontal closed solid doors, and SOC = service over counter);
- (BB)—An operating mode code (RC = remote condensing and SC = self-contained); and
- (C)—A rating temperature code [M = medium temperature (38°F), L = low temperature (0°F), or I = ice cream temperature (-15°F)].
- For example, "VOP.RC.M" refers to the "vertical open, remote condensing, medium temperature" equipment class.

d. V is the volume of the case (ft^3) as measured in AHRI 1200, Appendix C.

e. TDA is the total display area of the case (ft^2) as measured in AHRI 1200, Appendix D.

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C403.12.1 Duct and plenum insulation and sealing. Supply and return air ducts and plenums shall be insulated with not less than R-6 insulation where located in unconditioned spaces and where located outside the building with not less than R-8 insulation in *Climate Zones* 0 through 4 and not less than R-12 insulation in *Climate Zones* 5 through 8. Ducts located underground beneath buildings shall be insulated as required in this section or have an equivalent *thermal distribution efficiency*. Underground ducts utilizing the *thermal distribution efficiency* method shall be *listed* and *labeled* to indicate the *R*-value equivalency. Where located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by not less than R-8 insulation in *Climate Zones* 0 through 4 and not less than R-12 insulation in *Climate Zones* 5 through 8.

Exceptions:

1. Where located within equipment.
2. Where the design temperature difference between the interior and exterior of the duct or plenum is not greater than 15°F (8°C).

Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the *International Mechanical Code*.

C403.12.2 Duct construction. Ductwork shall be constructed and erected in accordance with the *International Mechanical Code*.

C403.12.2.1 Low-pressure duct systems. Longitudinal and transverse joints, seams and connections of supply and return ducts operating at a static pressure less than or equal to 2 inches water gauge (w.g.) (498 Pa) shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems or tapes installed in accordance with the manufacturer's instructions. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code*.

Exception: Locking-type longitudinal joints and seams, other than the snap-lock and button-lock types, need not be sealed as specified in this section.

C403.12.2.2 Medium-pressure duct systems. Ducts and plenums designed to operate at a static pressure greater than 2 inches water gauge (w.g.) (498 Pa) but less than 3 inches w.g. (747 Pa) shall be insulated and sealed in accordance with Section C403.12.1. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code.*

C403.12.2.3 High-pressure duct systems. Ducts and plenums designed to operate at static pressures equal to or greater than 3 inches water gauge (747 Pa) shall be insulated and sealed in accordance with Section C403.12.1. In addition, ducts and plenums shall be leak tested in accordance with the SMACNA HVAC Air Duct Leakage Test Manual and shown to have a rate of air leakage (CL) less than or equal to 4.0 as determined in accordance with Equation 4-8.

$$CL = F/P^{0.65} \qquad \textbf{(Equation 4-8)}$$

where:

F = The measured leakage rate in cfm per 100 square feet (9.3 m^2) of duct surface.

P = The static pressure of the test.

Documentation shall be furnished demonstrating that representative sections totaling not less than 25 percent of the duct area have been tested and that all tested sections comply with the requirements of this section.

C403.12.3 Piping insulation. Piping serving as part of a heating or cooling system shall be thermally insulated in accordance with Table C403.12.3.

Exceptions:

1. Factory-installed piping within HVAC equipment tested and rated in accordance with a test procedure referenced by this code.
2. Factory-installed piping within room fan-coils and unit ventilators tested and rated according to AHRI 440 (except that the sampling and variation provisions of Section 6.5 shall not apply) and AHRI 840, respectively.
3. Piping that conveys fluids that have a design operating temperature range between 60°F (15°C) and 105°F (41°C).
4. Piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
5. Strainers, control valves, and balancing valves associated with piping 1 inch (25 mm) or less in diameter.
6. Direct buried piping that conveys fluids at or below 60°F (15°C).
7. In radiant heating systems, sections of piping intended by design to radiate heat.

C403.12.3.1 Protection of piping insulation. Piping insulation exposed to the weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance and wind, and shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall not be permitted.

C403.13 Mechanical systems located outside of the building thermal envelope. Mechanical systems providing heat outside of the thermal envelope of a building shall comply with Sections C403.13.1 through C403.13.3.

C403.13.1 Heating outside a building. Systems installed to provide heat outside a building shall be radiant systems.

Such heating systems shall be controlled by an occupancy sensing device or a timer switch, so that the system is automatically de-energized when occupants are not present.

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C403.13.2 Snow- and ice-melt system controls. Snow- and ice-melting systems shall include automatic controls configured to shut off the system when the pavement temperature is above 50°F (10°C) and precipitation is not falling, and an automatic or manual control that is configured to shut off when the outdoor temperature is above 40°F (4°C).

C403.13.3 Freeze protection system controls. Freeze protection systems, such as heat tracing of outdoor piping and heat exchangers, including self-regulating heat tracing, shall include automatic controls configured to shut off the systems when outdoor air temperatures are above 40°F (4°C) or when the conditions of the protected fluid will prevent freezing.

C403.14 Operable opening interlocking controls. The heating and cooling systems shall have controls that will interlock these mechanical systems to the set temperatures of 90ºF (32ºC) for cooling and 55ºF (12.7ºC) for heating when the conditions of Section C402.5.8 exist. The controls shall configure to shut off the systems entirely when the outdoor temperatures are below 90ºF (32ºC) or above 55ºF (12.7ºC).

SECTION C404
SERVICE WATER HEATING

C404.1 General. This section covers the minimum efficiency of, and controls for, service water-heating equipment and insulation of service hot water piping.

C404.2 Service water-heating equipment performance efficiency. Water-heating equipment and hot water storage tanks shall meet the requirements of Table C404.2. The efficiency shall be verified through data furnished by the manufacturer of the equipment or through certification under an *approved* certification program. Water-heating equipment intended to be used to provide space heating shall meet the applicable provisions of Table C404.2.

C404.2.1 High input service water-heating systems. Gas-fired water-heating equipment installed in new buildings shall be in compliance with this section. Where a singular piece of water-heating equipment serves the entire building and the input rating of the equipment is 1,000,000 Btu/h (293 kW) or greater, such equipment shall have a thermal efficiency, E_t, of not less than 92 percent. Where multiple pieces of water-heating equipment serve the building and the combined input rating of the water-heating equipment is 1,000,000 Btu/h (293 kW) or greater, the combined input-capacity-weighted-average thermal efficiency, E_t, shall be not less than 90 percent.

Exceptions:

1. Where not less than 25 percent of the annual service water-heating requirement is provided by *on-site renewable energy* or site-recovered energy, the minimum thermal efficiency requirements of this section shall not apply.
2. The input rating of water heaters installed in individual dwelling units shall not be required to be included in the total input rating of service water-heating equipment for a building.
3. The input rating of water heaters with an input rating of not greater than 100,000 Btu/h (29.3 kW) shall not be required to be included in the total input rating of service water-heating equipment for a building.

TABLE C403.12.3
MINIMUM PIPE INSULATION THICKNESS (in inches)[a, c]

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (inches)				
	Conductivity Btu × in./(h × ft² × °F)[b]	Mean Rating Temperature, °F	< 1	1 to < 1 1/2	1 1/2 to < 4	4 to < 8	> 8
> 350	0.32–0.34	250	4.5	5.0	5.0	5.0	5.0
251–350	0.29–0.32	200	3.0	4.0	4.5	4.5	4.5
201–250	0.27–0.30	150	2.5	2.5	2.5	3.0	3.0
141–200	0.25–0.29	125	1.5	1.5	2.0	2.0	2.0
105–140	0.21–0.28	100	1.0	1.0	1.5	1.5	1.5
40–60	0.21–0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20–0.26	50	0.5	1.0	1.0	1.0	1.5

For SI: 1 inch = 25.4 mm, °C = [(°F) – 32]/1.8.

a. For piping smaller than 1 1/2 inches and located in partitions within conditioned spaces, reduction of these thicknesses by 1 inch shall be permitted (before thickness adjustment required in Note b) but not to a thickness less than 1 inch.

b. For insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows:

$T = r[(1 + t/r)^{K/k} - 1]$

where:

T = Minimum insulation thickness.

r = Actual outside radius of pipe.

t = Insulation thickness listed in the table for applicable fluid temperature and pipe size.

K = Conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature (Btu × in/h × ft² × °F).

k = The upper value of the conductivity range listed in the table for the applicable fluid temperature.

c. For direct-buried heating and hot water system piping, reduction of these thicknesses by 1 1/2 inches (38 mm) shall be permitted (before thickness adjustment required in Note b but not to thicknesses less than 1 inch.

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TABLE C404.2
MINIMUM PERFORMANCE OF WATER-HEATING EQUIPMENT

EQUIPMENT TYPE	SIZE CATEGORY (input)	SUBCATEGORY OR RATING CONDITION	PERFORMANCE REQUIRED[a, b]	TEST PROCEDURE
Water heaters, electric	≤ 12 kW[d]	Tabletop[e], ≥ 20 gallons and ≤ 120 gallons	0.93 – 0.00132V, EF	DOE 10 CFR Part 430
		Resistance ≥ 20 gallons and ≤ 55 gallons	0.960 – 0.0003V, EF	
		Grid-enabled[f] > 75 gallons and ≤ 120 gallons	1.061 – 0.00168V, EF	
	> 12 kW	Resistance	$(0.3 + 27/V_m)$, %/h	ANSI Z21.10.3
	≤ 24 amps and ≤ 250 volts	Heat pump > 55 gallons and ≤ 120 gallons	2.057 – 0.00113V, EF	DOE 10 CFR Part 430
Storage water heaters, gas	≤ 75,000 Btu/h	≥ 20 gallons and > 55 gallons	0.675 – 0.0015V, EF	DOE 10 CFR Part 430
		> 55 gallons and ≤ 100 gallons	0.8012 – 0.00078V, EF	
	> 75,000 Btu/h and ≤ 155,000 Btu/h	< 4,000 Btu/h/gal	80% E_t	ANSI Z21.10.3
	> 155,000 Btu/h	< 4,000 Btu/h/gal	80% E_t	
Instantaneous water heaters, gas	> 50,000 Btu/h and < 200,000 Btu/h[c]	≥ 4,000 Btu/h/gal and < 2 gal	0.82 – 0.00 19V, EF	DOE 10 CFR Part 430
	≥ 200,000 Btu/h	≥ 4,000 Btu/h/gal and < 10 gal	80% E_t	ANSI Z21.10.3
	≥ 200,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	80% E_t	
Storage water heaters, oil	≤ 105,000 Btu/h	≥ 20 gal and ≤ 50 gallons	0.68 – 0.0019V, EF	DOE 10 CFR Part 430
	≥ 105,000 Btu/h	< 4,000 Btu/h/gal	80% E_t	ANSI Z21.10.3
Instantaneous water heaters, oil	≤ 210,000 Btu/h	≥ 4,000 Btu/h/gal and < 2 gal	0.59 – 0.0019V, EF	DOE 10 CFR Part 430
	> 210,000 Btu/h	≥ 4,000 Btu/h/gal and < 10 gal	80% E_t	ANSI Z21.10.3
	> 210,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	78% E_t	
Hot water supply boilers, gas and oil	≥ 300,000 Btu/h and < 12,500,000 Btu/h	≥ 4,000 Btu/h/gal and < 10 gal	80% E_t	ANSI Z21.10.3
Hot water supply boilers, gas	≥ 300,000 Btu/h and < 12,500,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	80% E_t	
Hot water supply boilers, oil	> 300,000 Btu/h and < 12,500,000 Btu/h	> 4,000 Btu/h/gal and > 10 gal	78% E_t	
Pool heaters, gas and oil	All	—	82% E_t	ASHRAE 146
Heat pump pool heaters	All	—	4.0 COP	AHRI 1160
Unfired storage tanks	All	—	Minimum insulation requirement R-12.5 (h × ft² × °F)/Btu	(none)

$(Q/800 + 110\sqrt{V})SL$, Btu/h

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TABLE C404.2—continued
MINIMUM PERFORMANCE OF WATER-HEATING EQUIPMENT

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2, °C = [(°F) – 32]/1.8, 1 British thermal unit per hour = 0.2931 W, 1 gallon = 3.785 L, 1 British thermal unit per hour per gallon = 0.078 W/L.

a. Energy factor (EF) and thermal efficiency (E_t) are minimum requirements. In the EF equation, V is the rated volume in gallons.

b. Standby loss (SL) is the maximum Btu/h based on a nominal 70°F temperature difference between stored water and ambient requirements. In the SL equation, Q is the nameplate input rate in Btu/h. In the equations for electric water heaters, V is the rated volume in gallons and V_m is the measured volume in gallons. In the SL equation for oil and gas water heaters and boilers, V is the rated volume in gallons.

c. Instantaneous water heaters with input rates below 200,000 Btu/h shall comply with these requirements where the water heater is designed to heat water to temperatures 180°F or higher.

d. Electric water heaters with an input rating of 12 kW (40,950 Btu/h) or less that are designed to heat water to temperatures of 180°F or greater shall comply with the requirements for electric water heaters that have an input rating greater than 12 kW (40,950 Btu/h).

e A tabletop water heater is a water heater that is enclosed in a rectangular cabinet with a flat top surface not more than 3 feet in height.

f. A grid-enabled water heater is an electric-resistance water heater that meets all of the following:

1. Has a rated storage tank volume of more than 75 gallons.
2. Was manufactured on or after April 16, 2015.
3. Is equipped at the point of manufacture with an activation lock.
4. Bears a permanent label applied by the manufacturer that complies with all of the following:
   4.1. Is made of material not adversely affected by water.
   4.2. Is attached by means of nonwater-soluble adhesive.
   4.3. Advises purchasers and end users of the intended and appropriate use of the product with the following notice printed in 16.5 point Arial Narrow Bold font: "IMPORTANT INFORMATION: This water heater is intended only for use as part of an electric thermal storage or demand response program. It will not provide adequate hot water unless enrolled in such a program and activated by your utility company or another program operator. Confirm the availability of a program in your local area before purchasing or installing this product."

C404.3 Heat traps for hot water storage tanks. Storage tank-type water heaters and hot water storage tanks that have vertical water pipes connecting to the inlet and outlet of the tank shall be provided with integral heat traps at those inlets and outlets or shall have pipe-configured heat traps in the piping connected to those inlets and outlets. Tank inlets and outlets associated with solar water heating system circulation loops shall not be required to have heat traps.

C404.4 Insulation of piping. Piping from a water heater to the termination of the heated water fixture supply pipe shall be insulated in accordance with Table C403.12.3. On both the inlet and outlet piping of a storage water heater or heated water storage tank, the piping to a heat trap or the first 8 feet (2438 mm) of piping, whichever is less, shall be insulated. Piping that is heat traced shall be insulated in accordance with Table C403.12.3 or the heat trace manufacturer's instructions. Tubular pipe insulation shall be installed in accordance with the insulation manufacturer's instructions. Pipe insulation shall be continuous except where the piping passes through a framing member. The minimum insulation thickness requirements of this section shall not supersede any greater insulation thickness requirements necessary for the protection of piping from freezing temperatures or the protection of personnel against external surface temperatures on the insulation.

Exception: Tubular pipe insulation shall not be required on the following:

1. The tubing from the connection at the termination of the fixture supply piping to a plumbing fixture or plumbing appliance.
2. Valves, pumps, strainers and threaded unions in piping that is 1 inch (25 mm) or less in nominal diameter.
3. Piping from user-controlled shower and bath mixing valves to the water outlets.
4. Cold-water piping of a demand recirculation water system.
5. Tubing from a hot drinking-water heating unit to the water outlet.
6. Piping at locations where a vertical support of the piping is installed.
7. Piping surrounded by building insulation with a thermal resistance (R-value) of not less than R-3.

C404.5 Heated water supply piping. Heated water supply piping shall be in accordance with Section C404.5.1 or C404.5.2. The flow rate through $^1/_4$-inch (6.4 mm) piping shall be not greater than 0.5 gpm (1.9 L/m). The flow rate through $^5/_{16}$-inch (7.9 mm) piping shall be not greater than 1 gpm (3.8 L/m). The flow rate through $^3/_8$-inch (9.5 mm) piping shall be not greater than 1.5 gpm (5.7 L/m).

C404.5.1 Maximum allowable pipe length method. The maximum allowable piping length from the nearest source of heated water to the termination of the fixture supply pipe shall be in accordance with the following. Where the piping contains more than one size of pipe, the largest size of pipe within the piping shall be used for determining the maximum allowable length of the piping in Table C404.5.1.

1. For a public lavatory faucet, use the "Public lavatory faucets" column in Table C404.5.1.
2. For all other plumbing fixtures and plumbing appliances, use the "Other fixtures and appliances" column in Table C404.5.1.

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TABLE C404.5.1
PIPING VOLUME AND MAXIMUM PIPING LENGTHS

NOMINAL PIPE SIZE (inches)	VOLUME (liquid ounces per foot length)	MAXIMUM PIPING LENGTH (feet)	
		Public lavatory faucets	Other fixtures and appliances
1/4	0.33	6	50
5/16	0.5	4	50
3/8	0.75	3	50
1/2	1.5	2	43
5/8	2	1	32
3/4	3	0.5	21
7/8	4	0.5	16
1	5	0.5	13
1 1/4	8	0.5	8
1 1/2	11	0.5	6
2 or larger	18	0.5	4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 liquid ounce = 0.030 L, 1 gallon = 128 ounces.

C404.5.2 Maximum allowable pipe volume method. The water volume in the piping shall be calculated in accordance with Section C404.5.2.1. Water heaters, circulating water systems and heat trace temperature maintenance systems shall be considered to be sources of heated water.

The volume from the nearest source of heated water to the termination of the fixture supply pipe shall be as follows:

1. For a public lavatory faucet: not more than 2 ounces (0.06 L).
2. For other plumbing fixtures or plumbing appliances; not more than 0.5 gallon (1.89 L).

C404.5.2.1 Water volume determination. The volume shall be the sum of the internal volumes of pipe, fittings, valves, meters and manifolds between the nearest source of heated water and the termination of the fixture supply pipe. The volume in the piping shall be determined from the "Volume" column in Table C404.5.1 or from Table C404.5.2.1. The volume contained within fixture shutoff valves, within flexible water supply connectors to a fixture fitting and within a fixture fitting shall not be included in the water volume determination. Where heated water is supplied by a recirculating system or heat-traced piping, the volume shall include the portion of the fitting on the branch pipe that supplies water to the fixture.

C404.6 Heated-water circulating and temperature maintenance systems. Heated-water circulation systems shall be in accordance with Section C404.6.1. Heat trace temperature maintenance systems shall be in accordance with Section C404.6.2. Controls for hot water storage shall be in accordance with Section C404.6.3. Automatic controls, temperature sensors and pumps shall be in a location with *access*. Manual controls shall be in a location with *ready access*.

C404.6.1 Circulation systems. Heated-water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe or a cold water supply pipe. Gravity and thermo-syphon circulation systems shall be prohibited. Controls for circulating hot water system pumps shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is not a demand for hot water. The controls shall limit the temperature of the water entering the cold water piping to not greater than 104ºF (40°C).

C404.6.1.1 Demand recirculation controls. Demand recirculation water systems shall have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance, sensing the presence of a user of a fixture, or sensing the flow of hot or tempered water to a fixture fitting or appliance. **

C404.6.2 Heat trace systems. Electric heat trace systems shall comply with IEEE 515.1. Controls for such systems shall be able to automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy. Heat trace shall be arranged to be turned off automatically when there is not a demand for hot water.

C404.6.3 Controls for hot water storage. The controls on pumps that circulate water between a water heater and a heated-water storage tank shall limit operation of the pump from heating cycle startup to not greater than 5 minutes after the end of the cycle.

TABLE C404.5.2.1
INTERNAL VOLUME OF VARIOUS WATER DISTRIBUTION TUBING

	OUNCES OF WATER PER FOOT OF TUBE								
Nominal Size (inches)	Copper Type M	Copper Type L	Copper Type K	CPVC CTS SDR 11	CPVC SCH 40	CPVC SCH 80	PE-RT SDR 9	Composite ASTM F1281	PEX CTS SDR 9
3/8	1.06	0.97	0.84	N/A	1.17	—	0.64	0.63	0.64
1/2	1.69	1.55	1.45	1.25	1.89	1.46	1.18	1.31	1.18
3/4	3.43	3.22	2.90	2.67	3.38	2.74	2.35	3.39	2.35
1	5.81	5.49	5.17	4.43	5.53	4.57	3.91	5.56	3.91
1 1/4	8.70	8.36	8.09	6.61	9.66	8.24	5.81	8.49	5.81
1 1/2	12.18	11.83	11.45	9.22	13.20	11.38	8.09	13.88	8.09
2	21.08	20.58	20.04	15.79	21.88	19.11	13.86	21.48	13.86

For SI: 1 foot = 304.8 mm, 1 inch = 25.4 mm, 1 liquid ounce = 0.030 L, 1 oz/ft^2 = 305.15 g/m^2.
N/A = Not Available.

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C404.7 Drain water heat recovery units. Drain water heat recovery units shall comply with CSA B55.2. Potable water-side pressure loss shall be less than 10 psi (69 kPa) at maximum design flow. For *Group R* occupancies, the efficiency of drain water heat recovery unit efficiency shall be in accordance with CSA B55.1.

C404.8 Energy consumption of pools and permanent spas. The energy consumption of pools and permanent spas shall be controlled by the requirements in Sections C404.8.1 through C404.8.3.

C404.8.1 Heaters. The electric power to all heaters shall be controlled by an on-off switch that is an integral part of the heater, mounted on the exterior of the heater, or external to and within 3 feet (914 mm) of the heater in a location with *ready access*. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously burning ignition pilots.

C404.8.2 Time switches. Time switches or other control methods that can automatically turn off and on heaters and pump motors according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Pumps that operate solar- and waste-heat-recovery pool heating systems.

C404.8.3 Covers. Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other *approved* vapor-retardant means.

Exception: Where more than 75 percent of the energy for heating, computed over an operating season of not fewer than 3 calendar months, is from a heat pump or an on-site renewable energy system, covers or other vapor-retardant means shall not be required.

C404.9 Portable spas. The energy consumption of electric-powered portable spas shall be controlled by the requirements of APSP 14.

SECTION C405
ELECTRICAL POWER AND LIGHTING SYSTEMS

C405.1 General. Lighting system controls, the maximum lighting power for interior and exterior applications, and electrical energy consumption shall comply with this section. *Sleeping units* shall comply with Section C405.2.5 and with either Section C405.1.1 or C405.3. *General lighting* shall consist of all lighting included when calculating the total connected interior lighting power in accordance with Section C405.3.1 and which does not require specific application controls in accordance with Section C405.2.5.

Transformers, uninterruptable power supplies, motors and electrical power processing equipment in data center systems shall comply with Section 8 of ASHRAE 90.4 in addition to this code.

C405.1.1 Lighting for dwelling units. No less than 90 percent of the permanently installed lighting serving dwelling units, excluding kitchen appliance lighting, shall be provided by lamps with an efficacy of not less than 65 lm/W or luminaires with an efficacy of not less than 45 lm/W, or shall comply with Sections C405.2.4 and C405.3.

C405.2 Lighting controls. Lighting systems shall be provided with controls that comply with one of the following.

1. Lighting controls as specified in Sections C405.2.1 through C405.2.8.
2. Luminaire level lighting controls (LLLC) and lighting controls as specified in Sections C405.2.1, C405.2.5 and C405.2.6. The LLLC luminaire shall be independently capable of:
    2.1. Monitoring occupant activity to brighten or dim lighting when occupied or unoccupied, respectively.
    2.2. Monitoring ambient light, both electric light and daylight, and brighten or dim artificial light to maintain desired light level.
    2.3. For each control strategy, configuration and reconfiguration of performance parameters including; bright and dim setpoints, timeouts, dimming fade rates, sensor sensitivity adjustments, and wireless zoning configurations.

Exceptions: Lighting controls are not required for the following:

1. Areas designated as security or emergency areas that are required to be continuously lighted.
2. Interior exit stairways, interior exit ramps and exit passageways.
3. Emergency egress lighting that is normally off.

C405.2.1 Occupant sensor controls. Occupant *sensor controls* shall be installed to control lights in the following space types:

1. Classrooms/lecture/training rooms.
2. Conference/meeting/multipurpose rooms.
3. Copy/print rooms.
4. Lounges/breakrooms.
5. Enclosed offices.
6. Open plan office areas.
7. Restrooms.
8. Storage rooms.
9. Locker rooms.

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10. Corridors.
11. Warehouse storage areas.
12. Other spaces 300 square feet (28 m^2) or less that are enclosed by floor-to-ceiling height partitions.

Exception: Luminaires that are required to have specific application controls in accordance with Section C405.2.5.

C405.2.1.1 Occupant sensor control function. Occupant sensor controls in warehouses shall comply with Section C405.2.1.2. Occupant sensor controls in open plan office areas shall comply with Section C405.2.1.3. Occupant sensor controls in corridors shall comply with Section C405.2.1.4. Occupant sensor controls for all other spaces specified in Section C405.2.1 shall comply with the following:

1. They shall automatically turn off lights within 20 minutes after all occupants have left the space.
2. They shall be manual on or controlled to automatically turn on the lighting to not more than 50-percent power.
3. They shall incorporate a manual control to allow occupants to turn off lights.

Exception: Full automatic-on controls with no manual control shall be permitted in corridors, interior parking areas, stairways, restrooms, locker rooms, lobbies, library stacks and areas where manual operation would endanger occupant safety or security.

C405.2.1.2 Occupant sensor control function in warehouse storage areas. Lighting in warehouse storage areas shall be controlled as follows:

1. Lighting in each aisleway shall be controlled independently of lighting in all other aisleways and open areas.
2. Occupant sensors shall automatically reduce lighting power within each controlled area to an unoccupied setpoint of not more than 50 percent of full power within 20 minutes after all occupants have left the controlled area.
3. Lights that are not turned off by occupant sensors shall be turned off by time-switch control complying with Section C405.2.2.1.
4. A manual control shall be provided to allow occupants to turn off lights in the space.

C405.2.1.3 Occupant sensor control function in open plan office areas. Occupant sensor controls in open plan office spaces less than 300 square feet (28 m^2) in area shall comply with Section C405.2.1.1. Occupant sensor controls in all other open plan office spaces shall comply with all of the following:

1. The controls shall be configured so that general lighting can be controlled separately in control zones with floor areas not greater than 600 square feet (55 m^2) within the open plan office space.
2. General lighting in each control zone shall be permitted to automatically turn on upon occupancy within the control zone. General lighting in other unoccupied zones within the open plan office space shall be permitted to turn on to not more than 20 percent of full power or remain unaffected.
3. The controls shall automatically turn off general lighting in all control zones within 20 minutes after all occupants have left the open plan office space.

   Exception: Where general lighting is turned off by time-switch control complying with Section C405.2.2.1.
4. General lighting in each control zone shall turn off or uniformly reduce lighting power to an unoccupied setpoint of not more than 20 percent of full power within 20 minutes after all occupants have left the control zone.

C405.2.1.4 Occupant sensor control function in corridors. Occupant sensor controls in corridors shall uniformly reduce lighting power to an occupied setpoint not more than 50 percent of full power within 20 minutes after all occupants have left the space.

Exception: Corridors provided with less than two footcandles of illumination on the floor at the darkest point with all lights on.

C405.2.2 Time-switch controls. Each area of the building that is not provided with *occupant sensor controls* complying with Section C405.2.1.1 shall be provided with *time-switch controls* complying with Section C405.2.2.1.

Exceptions:

1. Luminaires that are required to have specific application controls in accordance with Section C405.2.4.
2. Spaces where patient care is directly provided.
3. Spaces where an automatic shutoff would endanger occupant safety or security.
4. Lighting intended for continuous operation.
5. Shop and laboratory classrooms.

C405.2.2.1 Time-switch control function. Time-switch *controls* shall comply with all of the following:

1. Automatically turn off lights when the space is scheduled to be unoccupied.
2. Have a minimum 7-day clock.
3. Be capable of being set for seven different day types per week.
4. Incorporate an automatic holiday "shutoff" feature, which turns off all controlled lighting

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loads for not fewer than 24 hours and then resumes normally scheduled operations.

5. Have program backup capabilities, which prevent the loss of program and time settings for not fewer than 10 hours, if power is interrupted.
6. Include an override switch that complies with the following:
   - 6.1. The override switch shall be a manual control.
   - 6.2. The override switch, when initiated, shall permit the controlled lighting to remain on for not more than 2 hours.
   - 6.3. Any individual override switch shall control the lighting for an area not larger than 5,000 square feet (465 m^2).

Exception: Within mall concourses, auditoriums, sales areas, manufacturing facilities and sports arenas:

1. The time limit shall be permitted to be greater than 2 hours, provided that the switch is a captive key device.
2. The area controlled by the override switch shall not be limited to 5,000 square feet (465 m^2) provided that such area is less than 20,000 square feet (1860 m^2).

* **C405.2.3 Light-reduction controls.** Where not provided with occupant sensor controls complying with Section C405.2.1.1, general lighting shall be provided with light-reduction controls complying with Section C405.2.3.1.

Exceptions:

1. Luminaires controlled by daylight responsive controls complying with Section C405.2.4.
2. Luminaires controlled by special application controls complying with Section C405.2.5.
3. Where provided with manual control, the following areas are not required to have light-reduction control:
   - 3.1. Spaces that have only one luminaire with a rated power of less than 60 watts.
   - 3.2. Spaces that use less than 0.45 watts per square foot (4.9 W/m²).
   - 3.3. Corridors, lobbies, electrical rooms and/or mechanical rooms.

** **C405.2.3.1 Light-reduction control function.** Spaces required to have light-reduction controls shall have a *manual control* that allows the occupant to reduce the connected lighting load by not less than 50 percent in a reasonably uniform illumination pattern with an intermediate step in addition to full on or off, or with continuous dimming control, using one of the following or another *approved* method:

1. Continuous dimming of all luminaires from full output to less than 20 percent of full power.
2. Switching all luminaires to a reduced output of not less than 30 percent and not more than 70 percent of full power.
3. Switching alternate luminaires or alternate rows of luminaires to achieve a reduced output of not less than 30 percent and not more than 70 percent of full power.

** **C405.2.4 Daylight-responsive controls.** *Daylight-responsive controls* complying with Section C405.2.4.1 shall be provided to control the general lighting within *daylight zones* in the following spaces:

1. Spaces with a total of more than 150 watts of *general lighting* within primary sidelit daylight zones complying with Section C405.2.4.2.
2. Spaces with a total of more than 300 watts of *general lighting* within sidelit daylight zones complying with Section C405.2.4.2.
3. Spaces with a total of more than 150 watts of *general lighting* within toplit daylight zones complying with Section C405.2.4.3.

Exceptions: Daylight responsive controls are not required for the following:

1. Spaces in health care facilities where patient care is directly provided.
2. Sidelit daylight zones on the first floor above grade in Group A-2 and Group M occupancies.
3. New buildings where the total connected lighting power calculated in accordance with Section C405.3.1 is not greater than the adjusted interior lighting power allowance (LPA_{adj}) calculated in accordance with Equation 4-9.

$$LPA_{adj} = [LPA_{norm} \times (1.0 - 0.4 \times UDZFA / TBFA)] \quad \textbf{(Equation 4-9)}$$

where:

LPA_{adj} = Adjusted building interior lighting power allowance in watts.

LPA_{norm} = Normal building lighting power allowance in watts calculated in accordance with Section C405.3.2 and reduced in accordance with Section C406.3 where Option 2 of Section C406.1 is used to comply with the requirements of Section C406.

$UDZFA$ = Uncontrolled daylight zone floor area is the sum of all sidelit and toplit zones, calculated in accor-

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dance with Sections C405.2.4.2 and C405.2.4.3, that do not have daylight responsive controls.

TBFA = Total building floor area is the sum of all floor areas included in the lighting power allowance calculation in Section C405.3.2.

C405.2.4.1 Daylight-responsive control function. Where required, *daylight-responsive controls* shall be provided within each space for control of lights in that space and shall comply with all of the following:

1. Lights in *toplit daylight zones* in accordance with Section C405.2.4.3 shall be controlled independently of lights in sidelit daylight zones in accordance with Section C405.2.4.2.
2. Lights in the primary sidelit daylight zone shall be controlled independently of lights in the secondary sidelit daylight zone.
3. *Daylight responsive controls* within each space shall be configured so that they can be calibrated from within that space by authorized personnel.
4. Calibration mechanisms shall be in a location with *ready access*.
5. *Daylight responsive controls* shall dim lights continuously from full light output to 15 percent of full light output or lower.
6. *Daylight responsive controls* shall be configured to completely shut off all controlled lights.
7. When occupant sensor controls have reduced the lighting power to an unoccupied setpoint in accordance with Sections C405.2.1.2 through C405.2.1.4, daylight responsive controls shall continue to adjust electric light levels in response to available daylight, but shall be configured to not increase the lighting power above the specified unoccupied setpoint.
8. Lights in *sidelit daylight zones* in accordance with Section C405.2.4.2 facing different cardinal orientations [within 45 degrees (0.79 rad) of due north, east, south, west] shall be controlled independently of each other.

Exceptions:

1. Within each space, up to 150 watts of lighting within the primary sidelit daylight zone is permitted to be controlled together with lighting in a primary sidelit daylight zone facing a different cardinal orientation.
2. Within each space, up to 150 watts of lighting within the secondary sidelit daylight zone is permitted to be controlled together with lighting in a secondary sidelit daylight zone facing a different cardinal orientation.

C405.2.4.2 Sidelit daylight zone. The sidelit daylight zone is the floor area adjacent to vertical *fenestration* that complies with all of the following:

1. Where the fenestration is located in a wall, the sidelit daylight zone shall extend laterally to the nearest full-height wall, or up to 1.0 times the height from the floor to the top of the fenestration, and longitudinally from the edge of the fenestration to the nearest full-height wall, or up to 0.5 times the height from the floor to the top of the fenestration, whichever is less, as indicated in Figure C405.2.4.2(1).
2. Where the fenestration is located in a rooftop monitor, the sidelit daylight zone shall extend laterally to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 1.0 times the height from the floor to the bottom of the fenestration, whichever is less, and longitudinally from the edge of the fenestration to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 0.25 times the height from the floor to the bottom of the fenestration, whichever is less, as indicated in Figures C405.2.4.2(2) and C405.2.4.2(3).
3. The secondary sidelit daylight zone is directly adjacent to the primary sidelit daylight zone and shall extend laterally to 2.0 times the height from the floor to the top of the fenestration or to the nearest full height wall, whichever is less, and longitudinally from the edge of the fenestration to the nearest full height wall, or up to 0.5 times the height from the floor to the top of the fenestration, whichever is less, as indicated in Figure C405.2.4.2(1). The area of secondary sidelit zones shall not be considered in the calculation of the daylight zones in Section C402.4.1.1.
4. The area of the fenestration is not less than 24 square feet (2.23 m^2).
5. The distance from the fenestration to any building or geological formation that would block *access to* daylight is greater than one-half of the height from the bottom of the fenestration to the top of the building or geologic formation.
6. The visible transmittance of the fenestration is not less than 0.20.
7. The projection factor (determined in accordance with Equation 4-5) for any overhanging projection that is shading the fenestration is not greater than 1.0 for fenestration oriented 45 degrees or less from true north and not greater than 1.5 for all other orientations.

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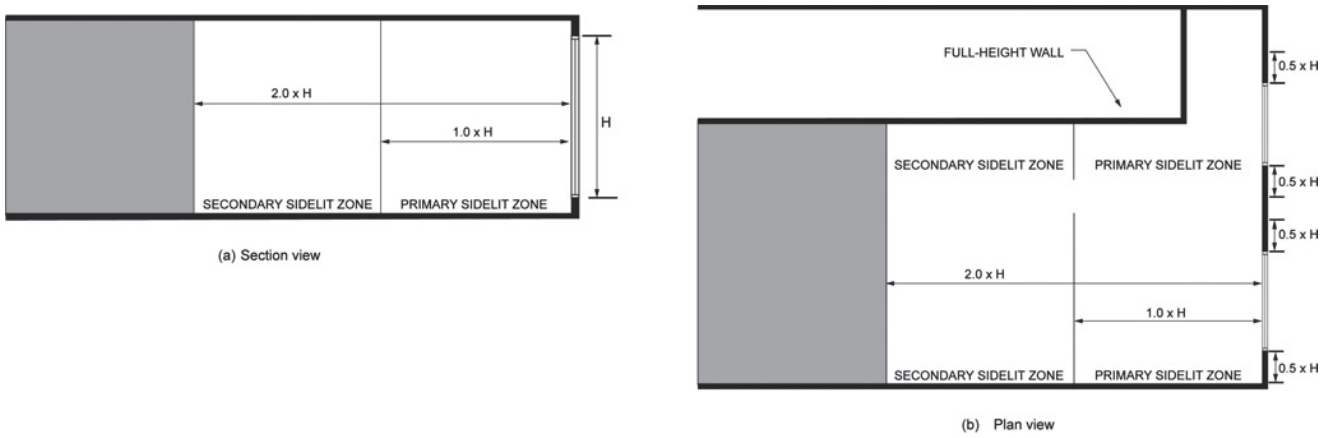
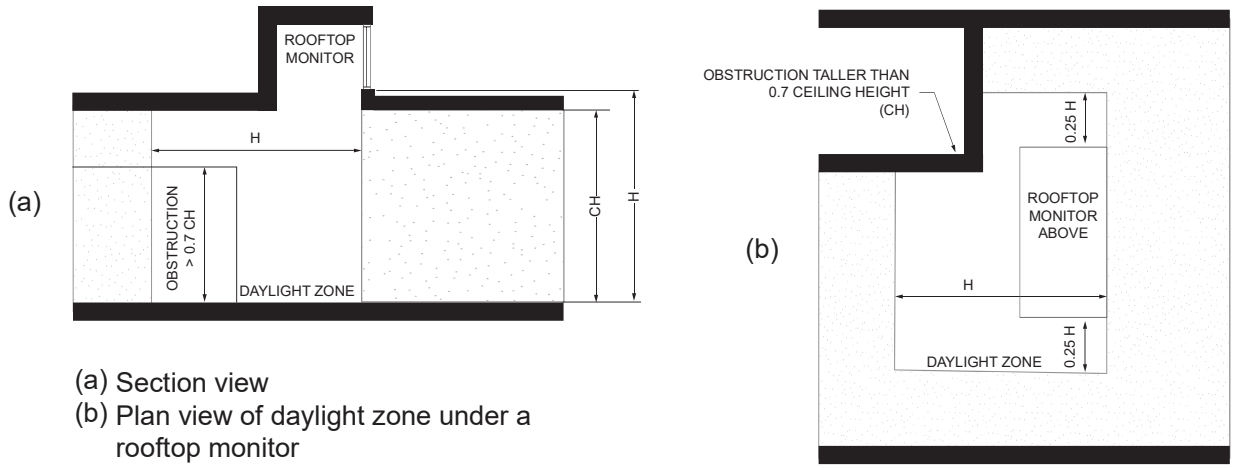
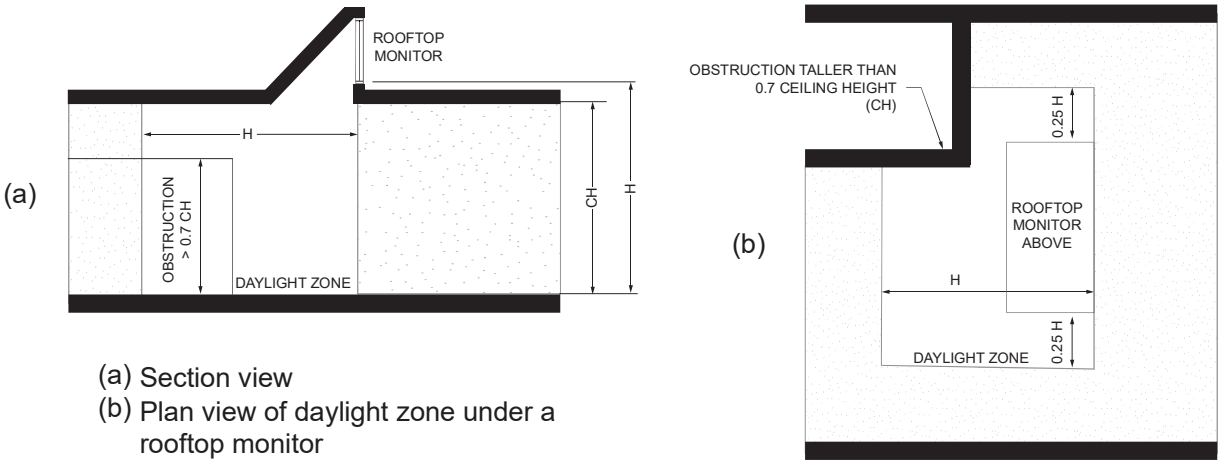


FIGURE C405.2.4.2(1)
PRIMARY AND SECONDARY SIDELIT DAYLIGHT ZONES



(a) Section view
(b) Plan view of daylight zone under a rooftop monitor

FIGURE C405.2.4.2(2)
DAYLIGHT ZONE UNDER A ROOFTOP MONITOR



(a) Section view
(b) Plan view of daylight zone under a rooftop monitor

FIGURE C405.2.4.2(3)
DAYLIGHT ZONE UNDER A SLOPED ROOFTOP MONITOR

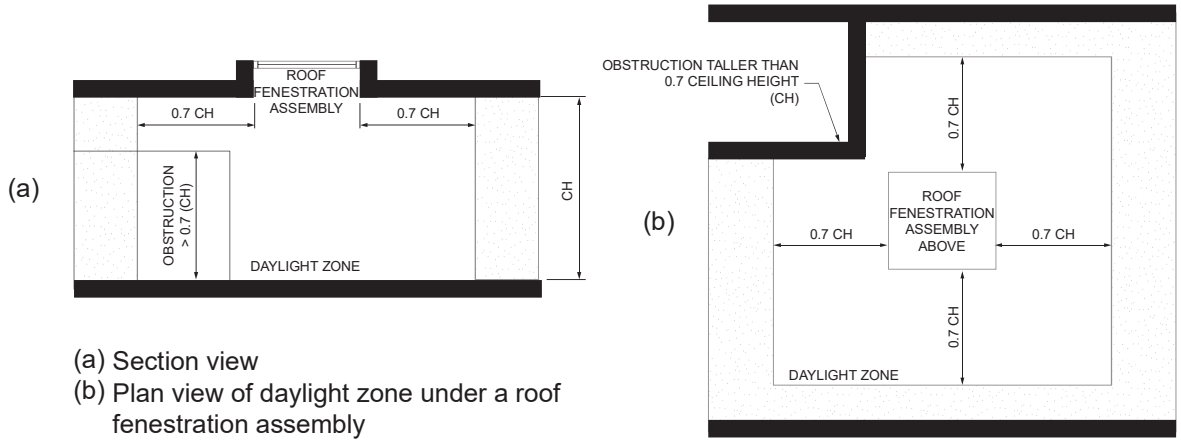
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C405.2.4.3 Toplit daylight zone. The *toplit daylight zone* is the floor area underneath a roof fenestration assembly that complies with all of the following:

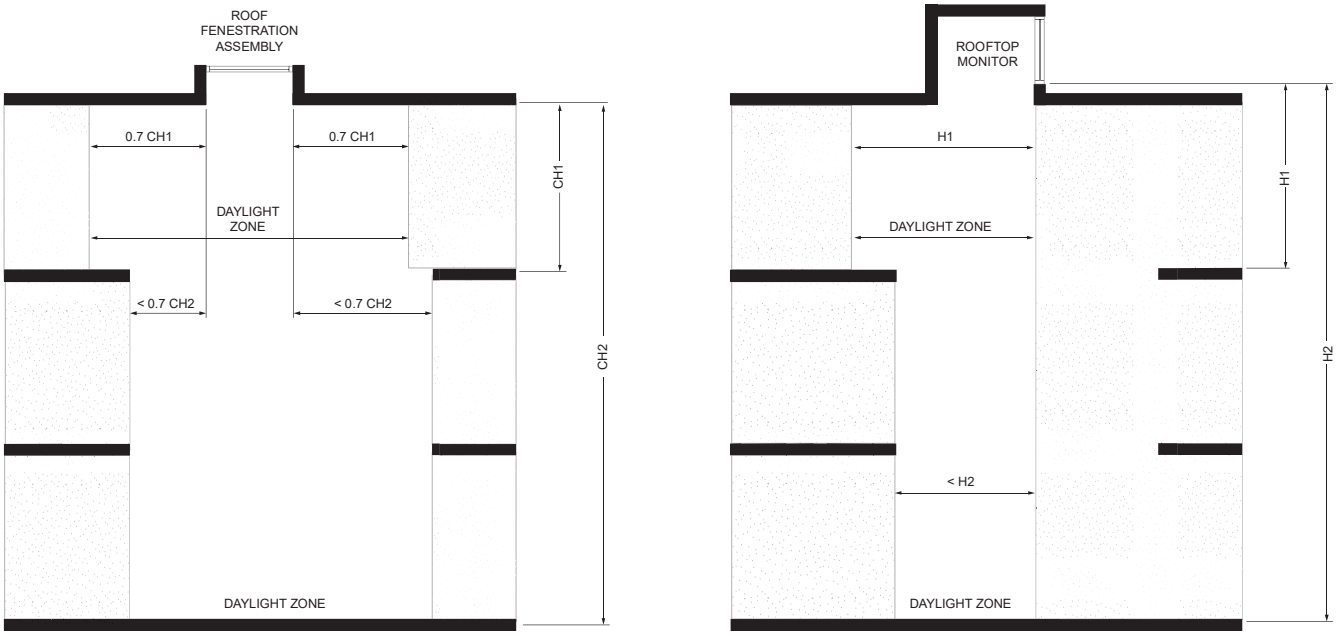
1. The toplit daylight zone shall extend laterally and longitudinally beyond the edge of the roof fenestration assembly to the nearest obstruction that is taller than 0.7 times the ceiling height, or up to 0.7 times the ceiling height, whichever is less, as indicated in Figure C405.2.4.3.
2. Direct sunlight is not blocked from hitting the roof fenestration assembly at the peak solar angle on the summer solstice by buildings or geological formations.
3. The product of the visible transmittance of the roof fenestration assembly and the area of the rough opening of the roof fenestration assembly divided by the area of the *toplit* zone is not less than 0.008.

C405.2.4.4 Atriums. Daylight zones at atrium spaces shall be established at the top floor surrounding the atrium and at the floor of the atrium space, and not on intermediate floors, as indicated in Figure C405.2.4.4.



(a) Section view
(b) Plan view of daylight zone under a roof fenestration assembly

FIGURE C405.2.4.3
TOPLIT DAYLIGHT ZONE



(a) Section view of roof fenestration assembly at atrium

(b) Section view of roof monitor at atrium

C405.2.4.4
DAYLIGHT ZONES AT A MULTISTORY ATRIUM

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C405.2.5 Specific application controls. Specific application controls shall be provided for the following:

1. The following lighting shall be controlled by an occupant sensor complying with Section C405.2.1.1 or a time-switch control complying with Section C405.2.2.1. In addition, a manual control shall be provided to control such lighting separately from the general lighting in the space:
   1.1. Luminaires for which additional lighting power is claimed in accordance with Section C405.3.2.2.1.
   1.2. Display and accent.
   1.3. Lighting in display cases.
   1.4. Supplemental task lighting, including permanently installed under-shelf or under-cabinet lighting.
   1.5. Lighting equipment that is for sale or demonstration in lighting education.
   1.6. Display lighting for exhibits in galleries, museums and monuments that is in addition to *general lighting*.
2. *Sleeping units* shall have control devices or systems that are configured to automatically switch off all permanently installed luminaires and switched receptacles within 20 minutes after all occupants have left the unit.

   Exceptions:

   1. Lighting and switched receptacles controlled by card key controls.
   2. Spaces where patient care is directly provided.
3. Permanently installed luminaires within *dwelling units* shall be provided with controls complying with Section C405.2.1.1 or C405.2.3.1.
4. Lighting for nonvisual applications, such as plant growth and food warming, shall be controlled by a time switch control complying with Section C405.2.2.1 that is independent of the controls for other lighting within the room or space.
5. Task lighting for medical and dental purposes that is in addition to *general lighting* shall be provided with a *manual control*.

C405.2.6 Manual controls. Where required by this code, manual controls for lights shall comply with the following:

1. They shall be in a location with *ready access* to occupants.
2. They shall be located where the controlled lights are visible, or shall identify the area served by the lights and indicate their status.

C405.2.7 Exterior lighting controls. Exterior lighting systems shall be provided with controls that comply with Sections C405.2.7.1 through C405.2.7.4.

Exceptions:

1. Lighting for covered vehicle entrances and exits from buildings and parking structures where required for eye adaptation.
2. Lighting controlled from within dwelling units.

C405.2.7.1 Daylight shutoff. Lights shall be automatically turned off when daylight is present and satisfies the lighting needs.

C405.2.7.2 Building facade and landscape lighting. Building facade and landscape lighting shall automatically shut off from not later than 1 hour after business closing to not earlier than 1 hour before business opening.

C405.2.7.3 Lighting setback. Lighting that is not controlled in accordance with Section C405.2.7.2 shall comply with the following:

1. Be controlled so that the total wattage of such lighting is automatically reduced by not less than 50 percent by selectively switching off or dimming luminaires at one of the following times:
   1.1. From not later than midnight to not earlier than 6 a.m.
   1.2. From not later than one hour after business closing to not earlier than one hour before business opening.
   1.3. During any time where activity has not been detected for 15 minutes or more.
2. Luminaires serving outdoor parking areas and having a rated input wattage of greater than 78 watts and a mounting height of 24 feet (7315 mm) or less above the ground shall be controlled so that the total wattage of such lighting is automatically reduced by not less than 50 percent during any time where activity has not been detected for 15 minutes or more. Not more than 1,500 watts of lighting power shall be controlled together.

C405.2.7.4 Exterior time-switch control function. Time-switch controls for exterior lighting shall comply with the following:

1. They shall have a clock capable of being programmed for not fewer than 7 days.
2. They shall be capable of being set for seven different day types per week.
3. They shall incorporate an automatic holiday setback feature.

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4. They shall have program backup capabilities that prevent the loss of program and time settings for a period of not less than 10 hours in the event that power is interrupted.

C405.2.8 Parking garage lighting control. Parking garage lighting shall be controlled by an *occupant sensor* complying with Section C405.2.1.1 or a *time-switch control* complying with Section C405.2.2.1. Additional lighting controls shall be provided as follows:

1. Lighting power of each luminaire shall be automatically reduced by not less than 30 percent when there is no activity detected within a lighting zone for 20 minutes. Lighting zones for this requirement shall be not larger than 3,600 square feet (334.5 m^2).

   Exception: Lighting zones provided with less than 1.5 footcandles of illumination on the floor at the darkest point with all lights on are not required to have automatic light-reduction controls.

2. Where lighting for eye adaptation is provided at covered vehicle entrances and exits from buildings and parking structures, such lighting shall be separately controlled by a device that automatically reduces lighting power by at least 50 percent from sunset to sunrise.
3. The power to luminaires within 20 feet (6096 mm) of perimeter wall openings shall automatically reduce in response to daylight by at least 50 percent.

Exceptions:

1. Where the opening-to-wall ratio is less than 40 percent as viewed from the interior and encompassing the vertical distance from the driving surface to the lowest structural element.
2. Where the distance from the opening to any exterior daylight blocking obstruction is less than one-half the height from the bottom of the opening or fenestration to the top of the obstruction.
3. Where openings are obstructed by permanent screens or architectural elements restricting daylight entering the interior space.

C405.3 Interior lighting power requirements. A building complies with this section where its total connected interior lighting power calculated under Section C405.3.1 is not greater than the interior lighting power allowance calculated under Section C405.3.2.

C405.3.1 Total connected interior lighting power. The total connected interior lighting power shall be determined in accordance with Equation 4-10.

$$TCLP = [LVL + BLL + LED + TRK + \text{Other}] \quad \textbf{(Equation 4-10)}$$

where:

TCLP = Total connected lighting power (watts).

LVL = For luminaires with lamps connected directly to building power, such as line voltage lamps, the rated wattage of the lamp.

BLL = For luminaires incorporating a ballast or transformer, the rated input wattage of the ballast or transformer when operating that lamp.

LED = For light-emitting diode luminaires with either integral or remote drivers, the rated wattage of the luminaire.

TRK = For lighting track, cable conductor, rail conductor, and plug-in busway systems that allow the addition and relocation of luminaires without rewiring, the wattage shall be one of the following:

1. The specified wattage of the luminaires, but not less than 8 W per linear foot (25 W/lin m).
2. The wattage limit of the permanent current-limiting devices protecting the system.
3. The wattage limit of the transformer supplying the system.

Other = The wattage of all other luminaires and lighting sources not covered previously and associated with interior lighting verified by data supplied by the manufacturer or other *approved* sources.

The connected power associated with the following lighting equipment and applications is not included in calculating total connected lighting power.

1. Television broadcast lighting for playing areas in sports arenas.
2. Emergency lighting automatically off during normal building operation.
3. Lighting in spaces specifically designed for use by occupants with special lighting needs, including those with visual impairment and other medical and age-related issues.
4. Casino gaming areas.
5. Mirror lighting in dressing rooms.
6. Task lighting for medical and dental purposes that is in addition to general lighting.
7. Display lighting for exhibits in galleries, museums and monuments that is in addition to general lighting.
8. Lighting for theatrical purposes, including performance, stage, film production and video production.
9. Lighting for photographic processes.

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10. Lighting integral to equipment or instrumentation and installed by the manufacturer.
11. Task lighting for plant growth or maintenance.
12. Advertising signage or directional signage.
13. Lighting for food warming.
14. Lighting equipment that is for sale.
15. Lighting demonstration equipment in lighting education facilities.
16. Lighting approved because of safety considerations.
17. Lighting in retail display windows, provided that the display area is enclosed by ceiling-height partitions.
18. Furniture-mounted supplemental task lighting that is controlled by automatic shutoff.
19. Exit signs.
20. Antimicrobial lighting used for the sole purpose of disinfecting a space.

C405.3.2 Interior lighting power allowance. The total interior lighting power allowance (watts) for an entire building shall be determined according to Table C405.3.2(1) using the Building Area Method or Table C405.3.2(2) using the Space-by-Space Method. The interior lighting power allowance for projects that involve only portions of a building shall be determined according to Table C405.3.2(2) using the Space-by-Space Method. Buildings with unfinished spaces shall use the Space-by-Space Method.

TABLE C405.3.2(1)
INTERIOR LIGHTING POWER ALLOWANCES: BUILDING AREA METHOD

BUILDING AREA TYPE	LPD (watts/ft^2)
Automotive facility	0.75
Convention center	0.64
Courthouse	0.79
Dining: bar lounge/leisure	0.80
Dining: cafeteria/fast food	0.76
Dining: family	0.71
Dormitory[a, b]	0.53
Exercise center	0.72
Fire station[a]	0.56
Gymnasium	0.76
Health care clinic	0.81
Hospital[a]	0.96
Hotel/Motel[a, b]	0.56
Library	0.83
Manufacturing facility	0.82
Motion picture theater	0.44
Multiple-family[c]	0.45
Museum	0.55
Office	0.64

(continued)

TABLE C405.3.2(1)—continued
INTERIOR LIGHTING POWER ALLOWANCES: BUILDING AREA METHOD

BUILDING AREA TYPE	LPD (watts/ft^2)
Parking garage	0.18
Penitentiary	0.69
Performing arts theater	0.84
Police station	0.66
Post office	0.65
Religious building	0.67
Retail	0.84
School/university	0.72
Sports arena	0.76
Town hall	0.69
Transportation	0.50
Warehouse	0.45
Workshop	0.91

For SI: 1 watt per square foot = 10.76 w/m^2.

a. Where sleeping units are excluded from lighting power calculations by application of Section R404.1, neither the area of the sleeping units nor the wattage of lighting in the sleeping units is counted.

b. Where dwelling units are excluded from lighting power calculations by application of Section R404.1, neither the area of the dwelling units nor the wattage of lighting in the dwelling units is counted.

c. Dwelling units are excluded. Neither the area of the dwelling units nor the wattage of lighting in the dwelling units is counted.

TABLE C405.3.2(2)
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

COMMON SPACE TYPES[a]	LPD (watts/ft^2)
Atrium	
Less than 40 feet in height	0.48
Greater than 40 feet in height	0.60
Audience seating area	
In an auditorium	0.61
In a gymnasium	0.23
In a motion picture theater	0.27
In a penitentiary	0.67
In a performing arts theater	1.16
In a religious building	0.72
In a sports arena	0.33
Otherwise	0.33
Banking activity area	0.61
Breakroom (See Lounge/breakroom)	
Classroom/lecture hall/training room	
In a penitentiary	0.89
Otherwise	0.71
Computer room, data center	0.94
Conference/meeting/multipurpose room	0.97
Copy/print room	0.31

(continued)

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TABLE C405.3.2(2)—continued
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

COMMON SPACE TYPES[a]	LPD (watts/ft²)
Corridor	
In a facility for the visually impaired (and not used primarily by the staff)[b]	0.71
In a hospital	0.71
Otherwise	0.41
Courtroom	1.20
Dining area	
In bar/lounge or leisure dining	0.86
In cafeteria or fast food dining	0.40
In a facility for the visually impaired (and not used primarily by the staff)[b]	1.27
In family dining	0.60
In a penitentiary	0.42
Otherwise	0.43
Electrical/mechanical room	0.43
Emergency vehicle garage	0.52
Food preparation area	1.09
Guestroom[c, d]	0.41
Laboratory	
In or as a classroom	1.11
Otherwise	1.33
Laundry/washing area	0.53
Loading dock, interior	0.88
Lobby	
For an elevator	0.65
In a facility for the visually impaired (and not used primarily by the staff)[b]	1.69
In a hotel	0.51
In a motion picture theater	0.23
In a performing arts theater	1.25
Otherwise	0.84
Locker room	0.52
Lounge/breakroom	
In a healthcare facility	0.42
Otherwise	0.59
Office	
Enclosed	0.74
Open plan	0.61
Parking area, interior	0.15
Pharmacy area	1.66
Restroom	
In a facility for the visually impaired (and not used primarily by the staff[b]	1.26
Otherwise	0.63
Sales area	1.05

TABLE C405.3.2(2)—continued
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

COMMON SPACE TYPES[a]	LPD (watts/ft²)
Seating area, general	0.23
Stairwell	0.49
Storage room	0.38
Vehicular maintenance area	0.60
Workshop	1.26
BUILDING TYPE SPECIFIC SPACE TYPES[a]	**LPD (watts/ ft²)**
Automotive (see Vehicular maintenance area)	
Convention Center—exhibit space	0.61
Dormitory—living quarters[c, d]	0.50
Facility for the visually impaired[b]	
In a chapel (and not used primarily by the staff)	0.70
In a recreation room (and not used primarily by the staff)	1.77
Fire Station—sleeping quarters[c]	0.23
Gymnasium/fitness center	
In an exercise area	0.90
In a playing area	0.85
Healthcare facility	
In an exam/treatment room	1.40
In an imaging room	0.94
In a medical supply room	0.62
In a nursery	0.92
In a nurse's station	1.17
In an operating room	2.26
In a patient room[c]	0.68
In a physical therapy room	0.91
In a recovery room	1.25
Library	
In a reading area	0.96
In the stacks	1.18
Manufacturing facility	
In a detailed manufacturing area	0.80
In an equipment room	0.76
In an extra-high-bay area (greater than 50 feet floor-to-ceiling height)	1.42
In a high-bay area (25–50 feet floor-to-ceiling height)	1.24
In a low-bay area (less than 25 feet floor-to-ceiling height)	0.86
Museum	
In a general exhibition area	0.31
In a restoration room	1.10
Performing arts theater—dressing room	0.41
Post office—sorting area	0.76

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TABLE C405.3.2(2)—continued
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

COMMON SPACE TYPES[a]	LPD (watts/ft²)
Religious buildings	
In a fellowship hall	0.54
In a worship/pulpit/choir area	0.85
Retail facilities	
In a dressing/fitting room	0.51
In a mall concourse	0.82
Sports arena—playing area	
For a Class I facility[e]	2.94
For a Class II facility[f]	2.01
For a Class III facility[g]	1.30
For a Class IV facility[h]	0.86
Transportation facility	
At a terminal ticket counter	0.51
In a baggage/carousel area	0.39
In an airport concourse	0.25
Warehouse—storage area	
For medium to bulky, palletized items	0.33
For smaller, hand-carried items	0.69

For SI: 1 foot = 304.8 mm, 1 watt per square foot = 10.76 w/m^2.

a. In cases where both a common space type and a building area specific space type are listed, the building area specific space type shall apply.
b. A 'Facility for the Visually Impaired' is a facility that is licensed or will be licensed by local or state authorities for senior long-term care, adult daycare, senior support or people with special visual needs.
c. Where sleeping units are excluded from lighting power calculations by application of Section R404.1, neither the area of the sleeping units nor the wattage of lighting in the sleeping units is counted.
d. Where dwelling units are excluded from lighting power calculations by application of Section R404.1, neither the area of the dwelling units nor the wattage of lighting in the dwelling units is counted.
e. Class I facilities consist of professional facilities; and semiprofessional, collegiate, or club facilities with seating for 5,000 or more spectators.
f. Class II facilities consist of collegiate and semiprofessional facilities with seating for fewer than 5,000 spectators; club facilities with seating for between 2,000 and 5,000 spectators; and amateur league and high school facilities with seating for more than 2,000 spectators.
g. Class III facilities consist of club, amateur league and high school facilities with seating for 2,000 or fewer spectators.
h. Class IV facilities consist of elementary school and recreational facilities; and amateur league and high school facilities without provision for spectators.

C405.3.2.1 Building Area Method. For the Building Area Method, the interior lighting power allowance is calculated as follows:

1. For each building area type inside the building, determine the applicable building area type and the allowed lighting power density for that type from Table C405.3.2(1). For building area types not listed, select the building area type that most closely represents the use of that area. For the purposes of this method, an "area" shall be defined as all contiguous spaces that accommodate or are associated with a single building area type.
2. Determine the floor area for each building area type listed in Table C405.3.2(1) and multiply this area by the applicable value from Table C405.3.2(1) to determine the lighting power (watts) for each building area type.
3. The total interior lighting power allowance (watts) for the entire building is the sum of the lighting power from each building area type.

C405.3.2.2 Space-by-Space Method. Where a building has unfinished spaces, the lighting power allowance for the unfinished spaces shall be the total connected lighting power for those spaces, or 0.2 watts per square foot (10.76 w/m^2), whichever is less. For the Space-by-Space Method, the interior lighting power allowance is calculated as follows:

1. For each space enclosed by partitions that are not less than 80 percent of the ceiling height, determine the applicable space type from Table C405.3.2(2). For space types not listed, select the space type that most closely represents the proposed use of the space. Where a space has multiple functions, that space may be divided into separate spaces.
2. Determine the total floor area of all the spaces of each space type and multiply by the value for the space type in Table C405.3.2(2) to determine the lighting power (watts) for each space type.
3. The total interior lighting power allowance (watts) shall be the sum of the lighting power allowances for all space types.

C405.3.2.2.1 Additional interior lighting power. Where using the Space-by-Space Method, an increase in the interior lighting power allowance is permitted for specific lighting functions. Additional power shall be permitted only where the specified lighting is installed and controlled in accordance with Section C405.2.5. This additional power shall be used only for the specified luminaires and shall not be used for any other purpose. An increase in the interior lighting power allowance is permitted in the following cases:

1. For lighting equipment to be installed in sales areas specifically to highlight merchandise, the additional lighting power shall be determined in accordance with Equation 4-11.

   Additional interior lighting power allowance = 1000 W + (Retail Area 1 × 0.45 W/ft^2) + (Retail Area 2 × 0.45W/ft^2) + (Retail Area 3 × 1.05 W/ft^2) + (Retail Area 4 × 1.87 W/ft^2)

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For SI units:

Additional interior lighting power allowance = 1000 W + (Retail Area 1 × 4.8 W/m^2) + (Retail Area 2 × 4.84 W/m^2) + (Retail Area 3 × 11 W/m^2) + (Retail Area 4 × 20 W/m^2) **(Equation 4-11)**

where:

Retail Area 1 = The floor area for all products not listed in Retail Area 2, 3 or 4.

Retail Area 2 = The floor area used for the sale of vehicles, sporting goods and small electronics.

Retail Area 3 = The floor area used for the sale of furniture, clothing, cosmetics and artwork.

Retail Area 4 = The floor area used for the sale of jewelry, crystal and china.

Exception: Other merchandise categories are permitted to be included in Retail Areas 2 through 4, provided that justification documenting the need for additional lighting power based on visual inspection, contrast or other critical display is approved by the code official.

2. For spaces in which lighting is specified to be installed in addition to the general lighting for the purpose of decorative appearance or for highlighting art or exhibits, provided that the additional lighting power shall be not more than 0.9 W/ft^2 (9.7 W/m^2) in lobbies and not more than 0.75 W/ft^2 (8.1 W/m^2) in other spaces.

C405.4 Lighting for plant growth and maintenance. Not less than 95 percent of the permanently installed luminaires used for plant growth and maintenance shall have a photon efficiency of not less than 1.6 µmol/J as defined in accordance with ANSI/ASABE S640.

C405.5 Exterior lighting power requirements. The total connected exterior lighting power calculated in accordance with Section C405.5.1 shall be not greater than the exterior lighting power allowance calculated in accordance with Section C405.5.2.

C405.5.1 Total connected exterior building exterior lighting power. The total exterior connected lighting power shall be the total maximum rated wattage of all lighting that is powered through the energy service for the building.

Exception: Lighting used for the following applications shall not be included.

1. Lighting *approved* because of safety considerations.
2. Emergency lighting automatically off during normal business operation.
3. Exit signs.
4. Specialized signal, directional and marker lighting associated with transportation.
5. Advertising signage or directional signage.
6. Integral to equipment or instrumentation and installed by its manufacturer.
7. Theatrical purposes, including performance, stage, film production and video production.
8. Athletic playing areas.
9. Temporary lighting.
10. Industrial production, material handling, transportation sites and associated storage areas.
11. Theme elements in theme/amusement parks.
12. Used to highlight features of art, public monuments and the national flag.
13. Lighting for water features and swimming pools.
14. Lighting controlled from within dwelling units, where the lighting complies with Section R404.1.

C405.5.2 Exterior lighting power allowance. The exterior lighting power allowance (watts) is calculated as follows:

1. Determine the Lighting Zone (LZ) for the building according to Table C405.5.2(1), unless otherwise specified by the code official.
2. For each exterior area that is to be illuminated by lighting that is powered through the energy service for the building, determine the applicable area type from Table C405.5.2(2). For area types not listed, select the area type that most closely represents the proposed use of the area.
3. Determine the total area or length of each area type and multiply by the value for the area type in Table C405.5.2(2) to determine the lighting power (watts) allowed for each area type.
4. The total exterior lighting power allowance (watts) is the sum of the base site allowance determined according to Table C405.5.2(2), plus the watts from each area type.

TABLE C405.5.2(1)
EXTERIOR LIGHTING ZONES

LIGHTING ZONE	DESCRIPTION
1	Developed areas of national parks, state parks, forest land, and rural areas
2	Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed-use areas
3	All other areas not classified as lighting zone 1, 2 or 4
4	High-activity commercial districts in major metropolitan areas as designated by the local land use planning authority

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TABLE C405.5.2(2)
LIGHTING POWER ALLOWANCES FOR BUILDING EXTERIORS

	LIGHTING ZONES			
	Zone 1	Zone 2	Zone 3	Zone 4
Base Site Allowance	350 W	400 W	500 W	900 W
Uncovered Parking Areas				
Parking areas and drives	0.03 W/ft^2	0.04 W/ft^2	0.06 W/ft^2	0.08 W/ft^2
Building Grounds				
Walkways and ramps less than 10 feet wide	0.50 W/linear foot	0.50 W/linear foot	0.60 W/linear foot	0.70 W/linear foot
Walkways and ramps 10 feet wide or greater, plaza areas, special feature areas	0.10 W/ft^2	0.10 W/ft^2	0.11 W/ft^2	0.14 W/ft^2
Dining areas	0.65 W/ft^2	0.65 W/ft^2	0.75 W/ft^2	0.95 W/ft^2
Stairways	0.60 W/ft^2	0.70 W/ft^2	0.70 W/ft^2	0.70 W/ft^2
Pedestrian tunnels	0.12 W/ft^2	0.12 W/ft^2	0.14 W/ft^2	0.21 W/ft^2
Landscaping	0.03 W/ft^2	0.04 W/ft^2	0.04 W/ft^2	0.04 W/ft^2
Building Entrances and Exits				
Pedestrian and vehicular entrances and exits	14 W/linear foot of opening	14 W/linear foot of opening	21 W/linear foot of opening	21 W/linear foot of opening
Entry canopies	0.20 W/ft^2	0.25 W/ft^2	0.40 W/ft^2	0.40 W/ft^2
Loading docks	0.35 W/ft^2	0.35 W/ft^2	0.35 W/ft^2	0.35 W/ft^2
Sales Canopies				
Free-standing and attached	0.40 W/ft^2	0.40 W/ft^2	0.60 W/ft^2	0.70 W/ft^2
Outdoor Sales				
Open areas (including vehicle sales lots)	0.20 W/ft^2	0.20 W/ft^2	0.35 W/ft^2	0.50 W/ft^2
Street frontage for vehicle sales lots in addition to “open area” allowance	No allowance	7 W/linear foot	7 W/linear foot	21 W/linear foot

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m^2.
W = watts.

TABLE C405.5.2(3)
INDIVIDUAL LIGHTING POWER ALLOWANCES FOR BUILDING EXTERIORS

	LIGHTING ZONES			
	Zone 1	Zone 2	Zone 3	Zone 4
Building facades	No allowance	0.075 W/ft^2 of gross above-grade wall area	0.113 W/ft^2 of gross above-grade wall area	0.15 W/ft^2 of gross above-grade wall area
Automated teller machines (ATM) and night depositories	135 W per location plus 45 W per additional ATM per location			
Uncovered entrances and gate-house inspection stations at guarded facilities	0.50 W/ft^2 of area			
Uncovered loading areas for law enforcement, fire, ambulance and other emergency service vehicles	0.35 W/ft^2 of area			
Drive-up windows and doors	200 W per drive through			
Parking near 24-hour retail entrances.	400 W per main entry			

For SI: For SI: 1 watt per square foot = W/0.0929 m^2.
W = watts.

C405.5.2.1 Additional exterior lighting power. Additional exterior lighting power allowances are available for the specific lighting applications listed in Table C405.5.2(3). These additional power allowances shall be used only for the luminaires serving these specific applications and shall not be used to increase any other lighting power allowance.

C405.5.3 Gas lighting. Gas-fired lighting appliances shall not be equipped with continuously burning pilot ignition systems.

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C405.6 Dwelling electrical meter. Each dwelling unit located in a Group R-2 building shall have a separate electrical meter.

C405.7 Electrical transformers. Low-voltage dry-type distribution electric transformers shall meet the minimum efficiency requirements of Table C405.7 as tested and rated in accordance with the test procedure listed in DOE 10 CFR 431. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the transformer manufacturer.

Exceptions: The following transformers are exempt:

1. Transformers that meet the *Energy Policy Act of 2005* exclusions based on the DOE 10 CFR 431 definition of special purpose applications.
2. Transformers that meet the *Energy Policy Act of 2005* exclusions that are not to be used in general purpose applications based on information provided in DOE 10 CFR 431.
3. Transformers that meet the *Energy Policy Act of 2005* exclusions with multiple voltage taps where the highest tap is not less than 20 percent more than the lowest tap.
4. Drive transformers.
5. Rectifier transformers.
6. Auto-transformers.
7. Uninterruptible power system transformers.
8. Impedance transformers.
9. Regulating transformers.
10. Sealed and nonventilating transformers.
11. Machine tool transformers.
12. Welding transformers.
13. Grounding transformers.
14. Testing transformers.

TABLE C405.7
MINIMUM NOMINAL EFFICIENCY LEVELS FOR DOE 10 CFR 431 LOW-VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS

SINGLE-PHASE TRANSFORMERS		THREE-PHASE TRANSFORMERS	
kVA[a]	Efficiency (%)[b]	kVA[a]	Efficiency (%)[b]
15	97.70	15	97.89
25	98.00	30	98.23
37.5	98.20	45	98.40
50	98.30	75	98.60
75	98.50	112.5	98.74
100	98.60	150	98.83
167	98.70	225	98.94
250	98.80	300	99.02
333	98.90	500	99.14
—	—	750	99.23
—	—	1000	99.28

a. kiloVolt-Amp rating.

b. Nominal efficiencies shall be established in accordance with the DOE 10 CFR 431 test procedure for low-voltage dry-type transformers.

C405.8 Electric motors. Electric motors shall meet the minimum efficiency requirements of Tables C405.8(1) through C405.8(4) when tested and rated in accordance with the DOE 10 CFR 431. The efficiency shall be verified through certification under an approved certification program or, where a certification program does not exist, the equipment efficiency ratings shall be supported by data furnished by the motor manufacturer.

Exception: The standards in this section shall not apply to the following exempt electric motors:

1. Air-over electric motors.
2. Component sets of an electric motor.
3. Liquid-cooled electric motors.
4. Submersible electric motors.
5. Inverter-only electric motors.

C405.9 Vertical and horizontal transportation systems and equipment. Vertical and horizontal transportation systems and equipment shall comply with this section.

C405.9.1 Elevator cabs. For the luminaires in each elevator cab, not including signals and displays, the sum of the lumens divided by the sum of the watts shall be not less than 35 lumens per watt. Ventilation fans in elevators that do not have their own air-conditioning system shall not consume more than 0.33 watts/cfm at the maximum rated speed of the fan. Controls shall be provided that will de-energize ventilation fans and lighting systems when the elevator is stopped, unoccupied and with its doors closed for over 15 minutes.

C405.9.2 Escalators and moving walks. Escalators and moving walks shall comply with ASME A17.1/CSA B44 and shall have automatic controls that reduce speed as permitted in accordance with ASME A17.1/CSA B44 and applicable local code.

Exception: A variable voltage drive system that reduces operating voltage in response to light loading conditions is an alternative to the reduced speed function.

C405.9.2.1 Energy recovery. Escalators shall be designed to recover electrical energy when resisting overspeed in the down direction.

C405.10 Voltage drop. The total *voltage drop* across the combination of customer-owned service conductors, feeder conductors and branch circuit conductors shall not exceed 5 percent.

C405.11 Automatic receptacle control. The following shall have automatic receptacle control complying with Section C405.11.1:

1. At least 50 percent of all 125V, 15- and 20-amp receptacles installed in enclosed offices, conference rooms, rooms used primarily for copy or print functions, breakrooms, classrooms and individual workstations, including those installed in

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modular partitions and module office workstation systems.

2. At least 25 percent of branch circuit feeders installed for modular furniture not shown on the construction documents.

C405.11.1 Automatic receptacle control function. Automatic receptacle controls shall comply with the following:

1. Either split controlled receptacles shall be provided with the top receptacle controlled, or a controlled receptacle shall be located within 12 inches (304.8 mm) of each uncontrolled receptacle.

TABLE C405.8(1)
MINIMUM NOMINAL FULL-LOAD EFFICIENCY FOR NEMA DESIGN A, NEMA DESIGN B, AND IEC DESIGN N MOTORS (EXCLUDING FIRE PUMP) ELECTRIC MOTORS AT 60 HZ[a, b]

MOTOR HORSEPOWER (STANDARD KILOWATT EQUIVALENT)	NOMINAL FULL-LOAD EFFICIENCY (%) AS OF JUNE 1, 2016							
	2 Pole		4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1 (0.75)	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5 (1.1)	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.0
2 (1.5)	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5
3 (2.2)	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5 (3.7)	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5 (5.5)	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10 (7.5)	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15 (11)	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
20 (15)	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
25 (18.5)	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30 (22)	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
40 (30)	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50 (37)	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60 (45)	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75 (55)	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100 (75)	94.1	93.6	95.4	95.4	95.0	95.0	93.6	94.1
125 (90)	95.0	94.1	95.4	95.4	95.0	95.0	94.1	94.1
150 (110)	95.0	94.1	95.8	95.8	95.8	95.4	94.1	94.1
200 (150)	95.4	95.0	96.2	95.8	95.8	95.4	94.5	94.1
250 (186)	95.8	95.0	96.2	95.8	95.8	95.8	95.0	95.0
300 (224)	95.8	95.4	96.2	95.8	95.8	95.8	—	—
350 (261)	95.8	95.4	96.2	95.8	95.8	95.8	—	—
400 (298)	95.8	95.8	96.2	95.8	—	—	—	—
450 (336)	95.8	96.2	96.2	96.2	—	—	—	—
500 (373)	95.8	96.2	96.2	96.2	—	—	—	—

a. Nominal efficiencies shall be established in accordance with DOE 10 CFR 431.

b. For purposes of determining the required minimum nominal full-load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two kilowatt ratings listed in this table, each such motor shall be deemed to have a listed horsepower or kilowatt rating, determined as follows:

1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.
2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.
3. A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula: 1 kilowatt = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with No. 1 or No. 2 above, as applicable.

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TABLE C405.8(2)
MINIMUM NOMINAL FULL-LOAD EFFICIENCY FOR NEMA DESIGN C AND IEC DESIGN H MOTORS AT 60 HZ[a, b]

MOTOR HORSEPOWER (STANDARD KILOWATT EQUIVALENT)	NOMINAL FULL-LOAD EFFICIENCY (%) AS OF JUNE 1, 2016					
	4 Pole		6 Pole		8 Pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open
1 (0.75)	85.5	85.5	82.5	82.5	75.5	75.5
1.5 (1.1)	86.5	86.5	87.5	86.5	78.5	77.0
2 (1.5)	86.5	86.5	88.5	87.5	84.0	86.5
3 (2.2)	89.5	89.5	89.5	88.5	85.5	87.5
5 (3.7)	89.5	89.5	89.5	89.5	86.5	88.5
7.5 (5.5)	91.7	91.0	91.0	90.2	86.5	89.5
10 (7.5)	91.7	91.7	91.0	91.7	89.5	90.2
15 (11)	92.4	93.0	91.7	91.7	89.5	90.2
20 (15)	93.0	93.0	91.7	92.4	90.2	91.0
25 (18.5)	93.6	93.6	93.0	93.0	90.2	91.0
30 (22)	93.6	94.1	93.0	93.6	91.7	91.7
40 (30)	94.1	94.1	94.1	94.1	91.7	91.7
50 (37)	94.5	94.5	94.1	94.1	92.4	92.4
60 (45)	95.0	95.0	94.5	94.5	92.4	93.0
75 (55)	95.4	95.0	94.5	94.5	93.6	94.1
100 (75)	95.4	95.4	95.0	95.0	93.6	94.1
125 (90)	95.4	95.4	95.0	95.0	94.1	94.1
150 (110)	95.8	95.8	95.8	95.4	94.1	94.1
200 (150)	96.2	95.8	95.8	95.4	94.5	94.1

a. Nominal efficiencies shall be established in accordance with DOE 10 CFR 431.

b. For purposes of determining the required minimum nominal full-load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two kilowatt ratings listed in this table, each such motor shall be deemed to have a listed horsepower or kilowatt rating, determined as follows:

1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.
2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.
3. A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula: 1 kilowatt = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with No. 1 or No. 2 above, as applicable.

TABLE C405.8(3)
MINIMUM AVERAGE FULL-LOAD EFFICIENCY POLYPHASE SMALL ELECTRIC MOTORS[a]

MOTOR HORSEPOWER	OPEN MOTORS			
	Number of Poles	2	4	6
	Synchronous Speed (RPM)	3600	1800	1200
0.25	—	65.6	69.5	67.5
0.33	—	69.5	73.4	71.4
0.50	—	73.4	78.2	75.3
0.75	—	76.8	81.1	81.7
1	—	77.0	83.5	82.5
1.5	—	84.0	86.5	83.8
2	—	85.5	86.5	N/A
3	—	85.5	86.9	N/A

N/A = Not Applicable.

a. Average full-load efficiencies shall be established in accordance with DOE 10 CFR 431.

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TABLE C405.8(4)
MINIMUM AVERAGE FULL-LOAD EFFICIENCY FOR CAPACITOR-START CAPACITOR-RUN AND CAPACITOR-START INDUCTION-RUN SMALL ELECTRIC MOTORS[a]

MOTOR HORSEPOWER	OPEN MOTORS			
	Number of Poles	2	4	6
	Synchronous Speed (RPM)	3600	1800	1200
0.25	—	66.6	68.5	62.2
0.33	—	70.5	72.4	66.6
0.50	—	72.4	76.2	76.2
0.75	—	76.2	81.8	80.2
1	—	80.4	82.6	81.1
1.5	—	81.5	83.8	N/A
2	—	82.9	84.5	N/A
3	—	84.1	N/A	N/A

N/A = Not Applicable.

a. Average full-load efficiencies shall be established in accordance with DOE 10 CFR 431.

2. One of the following methods shall be used to provide control:
   2.1. A scheduled basis using a time-of-day operated control device that turns receptacle power off at specific programmed times and can be programmed separately for each day of the week. The control device shall be configured to provide an independent schedule for each portion of the building of not more than 5,000 square feet (464.5 m^2) and not more than one floor. The occupant shall be able to manually override an area for not more than 2 hours. Any individual override switch shall control the receptacles of not more than 5,000 feet (1524 m).
   2.2. An occupant sensor control that shall turn off receptacles within 20 minutes of all occupants leaving a space.
   2.3. An automated signal from another control or alarm system that shall turn off receptacles within 20 minutes after determining that the area is unoccupied.
3. All controlled receptacles shall be permanently marked in accordance with NFPA 70 and be uniformly distributed throughout the space.
4. Plug-in devices shall not comply.

Exceptions: Automatic receptacle controls are not required for the following:

1. Receptacles specifically designated for equipment requiring continuous operation (24 hours per day, 365 days per year).
2. Spaces where an automatic control would endanger the safety or security of the room or building occupants.
3. Within a single modular office workstation, noncontrolled receptacles are permitted to be located more than 12 inches (304.8 mm), but not more than 72 inches (1828 mm) from the controlled receptacles serving that workstation.

C405.12 Energy monitoring. New buildings with a gross *conditioned floor area* of 25,000 square feet (2322 m^2) or larger shall be equipped to measure, monitor, record and report energy consumption data in compliance with Sections C405.12.1 through C405.12.5.

Exception: R-2 occupancies and individual tenant spaces are not required to comply with this section provided that the space has its own utility services and meters and has less than 5,000 square feet (464.5 m^2) of *conditioned floor area*.

C405.12.1 Electrical energy metering. For all electrical energy supplied to the building and its associated site, including but not limited to site lighting, parking, recreational facilities and other areas that serve the building and its occupants, meters or other measurement devices shall be provided to collect energy consumption data for each end-use category required by Section C405.12.2.

C405.12.2 End-use metering categories. Meters or other *approved* measurement devices shall be provided to collect energy use data for each end-use category indicated in Table C405.12.2. Where multiple meters are used to measure any end-use category, the data acquisition system shall total all of the energy used by that category. Not more than 5 percent of the measured load for each of the end-use categories indicated in Table C405.12.2 shall be permitted to be from a load that is not within that category.

Exceptions:

1. HVAC and water heating equipment serving only an individual dwelling unit shall not require end-use metering.
2. End-use metering shall not be required for fire pumps, stairwell pressurization fans or any system that operates only during testing or emergency.
3. End-use metering shall not be required for an individual tenant space having a floor area not greater than 2,500 square feet (232 m^2) where a dedicated source meter complying with Section C405.12.3 is provided.

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TABLE C405.12.2

ENERGY USE CATEGORIES

LOAD CATEGORY	DESCRIPTION OF ENERGY USE
Total HVAC system	Heating, cooling and ventilation, including but not limited to fans, pumps, boilers, chillers and water heating. Energy used by 120-volt equipment, or by 208/120-volt equipment that is located in a building where the main service is 480/277-volt power, is permitted to be excluded from total HVAC system energy use.
Interior lighting	Lighting systems located within the building.
Exterior lighting	Lighting systems located on the building site but not within the building.
Plug loads	Devices, appliances and equipment connected to convenience receptacle outlets.
Process load	Any single load that is not included in an HVAC, lighting or plug load category and that exceeds 5 percent of the peak connected load of the whole building, including but not limited to data centers, manufacturing equipment and commercial kitchens.
Building operations and other miscellaneous loads	The remaining loads not included elsewhere in this table, including but not limited to vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains, ornamental fireplaces, swimming pools, in-ground spas and snow-melt systems.

C405.12.3 Meters. Meters or other measurement devices required by this section shall be configured to automatically communicate energy consumption data to the data acquisition system required by Section C405.12.4. Source meters shall be allowed to be any digital-type meter. Lighting, HVAC or other building systems that can monitor their energy consumption shall be permitted instead of meters. Current sensors shall be permitted, provided that they have a tested accuracy of ±2 percent. Required metering systems and equipment shall have the capability to provide at least hourly data that is fully integrated into the data acquisition system and graphical energy report in accordance with Sections C405.12.4 and C405.12.5.

C405.12.4 Data acquisition system. A data acquisition system shall have the capability to store the data from the required meters and other sensing devices for a minimum of 36 months. The data acquisition system shall have the capability to store real-time energy consumption data and provide hourly, daily, monthly and yearly logged data for each end-use category required by Section C405.12.2.

C405.12.5 Graphical energy report. A permanent and readily accessible reporting mechanism shall be provided in the building that is accessible by building operation and management personnel. The reporting mechanism shall have the capability to graphically provide the energy consumption for each end-use category required by Section C405.12.2 at least every hour, day, month and year for the previous 36 months.

SECTION C406
ADDITIONAL EFFICIENCY REQUIREMENTS

C406.1 Additional energy efficiency credit requirements. New buildings shall achieve a total of 10 credits from Tables C406.1(1) through C406.1(5) where the table is selected based on the use group of the building and from credit calculations as specified in relevant subsections of Section C406. Where a building contains multiple-use groups, credits from each use group shall be weighted by floor area of each group to determine the weighted average building credit. Credits from the tables or calculation shall be achieved where a building complies with one or more of the following:

1. More efficient HVAC performance in accordance with Section C406.2.
2. Reduced lighting power in accordance with Section C406.3.
3. Enhanced lighting controls in accordance with Section C406.4.
4. On-site supply of renewable energy in accordance with Section C406.5.
5. Provision of a dedicated outdoor air system for certain HVAC equipment in accordance with Section C406.6.
6. High-efficiency service water heating in accordance with Section C406.7.
7. Enhanced envelope performance in accordance with Section C406.8.
8. Reduced air infiltration in accordance with Section C406.9
9. Where not required by Section C405.12, include an energy monitoring system in accordance with Section C406.10.
10. Where not required by Section C403.2.3, include a fault detection and diagnostics (FDD) system in accordance with Section C406.11.
11. Efficient kitchen equipment in accordance with Section C406.12.

C406.1.1 Tenant spaces. Tenant spaces shall comply with sufficient options from Tables C406.1(1) through C406.1(5) to achieve a minimum number of 5 credits, where credits are selected from Section C406.2, C406.3, C406.4, C406.6, C406.7 or C406.10. Where the entire building complies using credits from Section C406.5, C406.8 or C406.9, tenant spaces shall be deemed to comply with this section.

Exception: Previously occupied tenant spaces that comply with this code in accordance with Section C501.

C406.2 More efficient HVAC equipment performance. Equipment shall exceed the minimum efficiency requirements listed in the tables in Section C403.3.2. *Variable refrigerant flow systems* listed in the energy efficiency provisions of ANSI/ASHRAE/IES 90.1 in accordance with Section C406.2.1, C406.2.2, C406.2.3 or C406.2.4 shall also meet applicable requirements of Section C403. Energy efficiency credits for heating shall be selected from Section

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C406.2.1 or C406.2.3 and energy efficiency credits for cooling shall be selected from Section C406.2.2, C406.2.4 or C406.2.5. Selected credits shall include a heating or cooling energy efficiency credit or both. Equipment not listed in Tables C403.3.2(1) through C403.3.2(9) and *variable refrigerant flow systems* not listed in the energy efficiency provisions of ANSI/ASHRAE/IES 90.1 shall be limited to 10 percent of the total building system capacity for heating equipment where selecting Section C406.2.1 or C406.2.3 and cooling equipment where selecting Section C406.2.2, C406.2.4 or C406.2.5.

C406.2.1 Five-percent heating efficiency improvement. Equipment shall exceed the minimum heating efficiency requirements by 5 percent.

C406.2.2 Five-percent cooling efficiency improvement. Equipment shall exceed the minimum cooling and heat rejection efficiency requirements by 5 percent. Where multiple cooling performance requirements are provided, the equipment shall exceed the annual energy requirement, including IEER, SEER and IPLV.

C406.2.3 Ten-percent heating efficiency improvement. Equipment shall exceed the minimum heating efficiency requirements by 10 percent.

C406.2.4 Ten-percent cooling efficiency improvement. Equipment shall exceed the minimum cooling and heat rejection efficiency requirements by 10 percent. Where multiple cooling performance requirements are provided, the equipment shall exceed the annual energy requirement, including IEER, SEER and IPLV.

C406.2.5 More than 10-percent cooling efficiency improvement. Where equipment exceeds the minimum annual cooling and heat rejection efficiency requirements by more than 10 percent, energy efficiency credits for cooling may be determined using Equation 4-12, rounded to the nearest whole number. Where multiple cooling performance requirements are provided, the equipment shall exceed the annual energy requirement, including IEER, SEER and IPLV.

$$EEC_{HEC} = EEC_{10}\,[1 + ((CEI - 10\text{ percent}) \div 10\text{ percent})] \quad \textbf{(Equation 4-12)}$$

TABLE C406.1(1)
ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP B OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	1	1	NA	1
C406.2.2: 5% cooling efficiency improvement	6	6	5	5	4	4	3	3	3	2	2	2	1	2	2	2	1
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2	1	1	2	2	NA	1
C406.2.4: 10% cooling efficiency improvement	11	12	10	9	7	7	6	5	6	4	4	5	3	4	3	3	3
C406.3: Reduced lighting power	9	8	9	9	9	9	10	8	9	9	7	8	8	6	7	7	6
C406.4: Enhanced digital lighting controls	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	1	1
C406.5: On-site renewable energy	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
C406.6: Dedicated outdoor air	4	4	4	4	4	3	2	5	3	2	5	3	2	7	4	5	3
C406.7.2: Recovered or renewable water heating	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.3: Efficient fossil fuel water heater	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.4: Heat pump water heater	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.8: Enhanced envelope performance	1	4	2	4	4	3	NA	7	4	5	10	7	6	11	10	14	16
C406.9: Reduced air infiltration	2	1	1	2	4	1	NA	8	2	3	11	4	1	15	8	11	6
C406.10: Energy monitoring	4	4	4	4	3	3	3	3	3	3	2	3	2	2	2	2	2
C406.11: Fault detection and diagnostics system	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1

NA = Not Applicable.

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where:

EEC_{HEC} = Energy efficiency credits for cooling efficiency improvement.

EEC_{10} = Section C406.2.4 credits from Tables C406.1(1) through C406.1(5).

CEI = The lesser of: the improvement above minimum cooling and heat rejection efficiency requirements or 15 percent.

C406.3 Reduced lighting power. Buildings shall comply with Section C406.3.1 or C406.3.2, and dwelling units and sleeping units within the building shall comply with Section C406.3.3.

C406.3.1 Reduced lighting power by more than 10 percent. The total connected interior lighting power calculated in accordance with Section C405.3.1 shall be less than 90 percent of the total lighting power allowance calculated in accordance with Section C405.3.2.

C406.3.2 Reduced lighting power by more than 15 percent. Where the total connected interior lighting power calculated in accordance with Section C405.3.1 is less than 85 percent of the total lighting power allowance calculated in accordance with Section C405.3.2, additional energy efficiency credits shall be determined based on Equation 4-13, rounded to the nearest whole number.

$$AEEC_{LPA} = AEEC_{10} \times 10 \times (LPA - LPD) / LPA \quad \textbf{(Equation 4-13)}$$

where:

$AEEC_{LPA}$ = Section C406.3.2 additional energy efficiency credits.

$AEEC_{10}$ = Section C406.3.1 credits from Tables C406.1(1) through C406.1(5).

LPA = Total lighting power allowance calculated in accordance with Section C405.3.2.

LPD = Total connected interior lighting power calculated in accordance with Section C405.3.1.

C406.3.3 Lamp efficacy. Not less than 95 percent of the permanently installed lighting, excluding kitchen appli-

TABLE C406.1(2)
ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP R AND I OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	1	NA	NA	1	NA	1	1	1	1	2	1	2	2
C406.2.2: 5% cooling efficiency improvement	3	3	2	2	1	1	1	1	1	NA	1	1	NA	1	1	1	NA
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	NA	1	NA	NA	1	1	1	2	2	1	3	2	3	4
C406.2.4: 10% cooling efficiency improvement	5	5	4	3	2	3	1	2	2	1	1	1	1	1	1	1	1
C406.3: Reduced lighting power	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
C406.4: Enhanced digital lighting controls	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.5: On-site renewable energy	8	8	8	8	7	8	8	7	7	7	7	7	7	7	7	7	7
C406.6: Dedicated outdoor air system	3	4	3	3	4	2	NA	6	3	4	8	5	5	10	7	11	12
C406.7.2: Recovered or renewable water heating	10	9	11	10	13	12	15	14	14	15	14	14	16	14	15	15	15
C406.7.3: Efficient fossil fuel water heater	5	5	6	6	8	7	8	8	8	9	9	9	10	10	9	10	11
C406.7.4: Heat pump water heater	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
C406.8: Enhanced envelope performance	3	6	3	5	4	4	1	4	3	3	4	5	3	5	4	6	6
C406.9: Reduced air infiltration	6	5	3	11	6	4	NA	7	3	3	9	5	1	13	6	8	3
C406.10: Energy monitoring	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C406.11: Fault detection and diagnostics system	1	1	1	1	1	1	NA	1	1	NA	1	1	NA	1	1	1	1

NA = Not Applicable.

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ance light fixtures, serving dwelling units and sleeping units shall be provided by lamps with an efficacy of not less than 65 lumens per watt or luminaires with an efficacy of not less than 45 lumens per watt.

C406.4 Enhanced digital lighting controls. Interior general lighting in the building shall have the following enhanced lighting controls that shall be located, scheduled and operated in accordance with Sections C405.2.1 through C405.2.3.

1. Luminaires shall be configured for continuous dimming.
2. Luminaires shall be addressed individually. Where individual addressability is not available for the luminaire class type, a controlled group of not more than four luminaries shall be allowed.
3. Not more than eight luminaires shall be controlled together in a *daylight zone*.
4. Fixtures shall be controlled through a digital control system that includes the following function:
   - 4.1. Control reconfiguration based on digital addressability.
   - 4.2. Load shedding.
   - 4.3. Occupancy sensors shall be capable of being reconfigured through the digital control system.
5. Construction documents shall include submittal of a Sequence of Operations, including a specification outlining each of the functions in Item 4.
6. Functional testing of lighting controls shall comply with Section C408.

C406.5 On-site renewable energy. Buildings shall comply with Section C406.5.1 or C406.5.2.

C406.5.1 Basic renewable credit. The total minimum ratings of on-site renewable energy systems, not includ-

TABLE C406.1(3)
ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP E OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	1	1	1	1	1	2	1	2	1	2	2	3	4
C406.2.2: 5% cooling efficiency improvement	4	4	3	3	2	2	2	2	1	1	1	1	NA	1	1	1	NA
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	1	1	1	1	2	3	4	3	4	3	4	3	5	7
C406.2.4: 10% cooling efficiency improvement	7	8	7	6	5	4	3	4	3	1	2	2	1	2	2	2	1
C406.3: Reduced lighting power	8	8	8	9	8	9	9	8	9	9	8	9	8	7	8	7	7
C406.4: Enhanced digital lighting controls	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
C406.5: On-site renewable energy	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5
C406.6: Dedicated outdoor air system	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.2: Recovered or renewable water heating[a]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C406.7.3: Efficient fossil fuel water heater[a]	NA	1	1	1	1	1	1	2	2	3	2	3	2	3	3	3	5
C406.7.4: Heat pump water heater[a]	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	1	1	NA	1	1	1	1
C406.8: Enhanced envelope performance	3	7	3	4	2	4	1	1	3	1	2	3	NA	4	3	6	9
C406.9: Reduced air infiltration	1	1	1	2	NA	NA	NA	NA	NA	NA	1	NA	NA	4	1	4	3
C406.10: Energy monitoring	3	3	3	3	3	3	3	3	3	2	2	3	2	2	2	2	2
C406.11: Fault detection and diagnostics system	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2

NA = Not Applicable.

a. For schools with showers or full-service kitchens.

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ing systems used for credits under Sections C406.7.2, shall be one of the following:

1. Not less than 0.86 Btu/h per square foot (2.7 W/m^2) or 0.25 watts per square foot (2.7 W/m^2) of *conditioned floor area*.
2. Not less than 2 percent of the annual energy used within the building for building mechanical and service water-heating equipment and lighting regulated in Section C405.

C406.5.2 Enhanced renewable credit. Where the total minimum ratings of on-site renewable energy systems exceeds the rating in Section C406.5.1, additional energy efficiency credits shall be determined based on Equation 4-14, rounded to the nearest whole number.

$$AEEC_{RRa} = AEEC_{2.5} \times RRa/RR_1 \quad \textbf{(Equation 4-14)}$$

where:

$AEEC_{RRa}$ = Section C406.5.2 additional energy efficiency credits.

$AEEC_{2.5}$ = Section C406.5 credits from Tables C406.1(1) through C406.1(5).

RRa = Actual total minimum ratings of *on-site renewable energy* systems (in Btu/h, watts per square foot or W/m^2).

RR_1 = Minimum ratings of *on-site renewable energy* systems required by Section C406.5.1 (in Btu/h, watts per square foot or W/m^2).

C406.6 Dedicated outdoor air system. Buildings containing equipment or systems regulated by Section C403.3.4, C403.4.3, C403.4.4, C403.4.5, C403.6, C403.8.4, C403.8.6, C403.8.6.1, C403.10.1, C403.10.2, C403.10.3 or C403.10.4 shall be equipped with an independent ventilation system designed to provide not less than the minimum 100-percent outdoor air to each individual occupied space, as specified by the *International Mechanical Code*. The ventilation system shall be capable of total energy recovery. The HVAC system shall include supply-air temperature controls that automatically reset the supply-air temperature in response to representative building loads or to outdoor air temperatures. The controls shall reset the supply-air temperature not less

TABLE C406.1(4)
ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP M OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	1	1	NA	1	1	2	2	2	2	3	2	3	4
C406.2.2: 5% cooling efficiency improvement	5	6	4	4	3	3	1	2	2	1	1	2	NA	1	1	1	NA
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	1	1	1	1	2	2	4	3	4	5	5	3	6	8
C406.2.4: 10% cooling efficiency improvement	9	12	9	8	6	6	3	4	4	1	2	3	NA	2	2	2	1
C406.3: Reduced lighting power	13	13	15	14	16	14	17	15	15	14	12	14	14	16	16	14	12
C406.4: Enhanced digital lighting controls	3	3	4	3	4	3	4	4	4	3	3	3	3	4	4	3	3
C406.5: On-site renewable energy	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	6
C406.6: Dedicated outdoor air system	3	4	3	3	3	3	1	3	2	2	2	3	2	4	3	4	4
C406.7.2: Recovered or renewable water heating	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.3: Efficient fossil fuel water heater	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.4: Heat pump water heater	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.8: Enhanced envelope performance	4	6	3	4	3	3	1	6	4	4	4	5	4	6	5	8	9
C406.9: Reduced air infiltration	1	1	1	2	1	1	NA	3	1	1	3	2	1	7	3	6	3
C406.10: Energy monitoring	4	5	5	5	5	4	4	4	4	3	3	4	3	4	4	4	3
C406.11: Fault detection and diagnostics system	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2

NA = Not Applicable.

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than 25 percent of the difference between the design supply-air temperature and the design room-air temperature.

C406.7 Reduced energy use in service water heating. Buildings shall comply with Section C406.7.1 and Section C406.7.2, C406.7.3 or C406.7.4.

C406.7.1 Building type. To qualify for this credit, the building shall contain one of the following use groups, and the additional energy efficiency credit shall be prorated by conditioned floor area of the portion of the building comprised of the following use groups:

1. Group R-1: Boarding houses, hotels or motels.
2. Group I-2: Hospitals, psychiatric hospitals and nursing homes.
3. Group A-2: Restaurants and banquet halls or buildings containing food preparation areas.
4. Group F: Laundries.
5. Group R-2.
6. Group A-3: Health clubs and spas.
7. Group E: Schools with full-service kitchens or locker rooms with showers.
8. Buildings showing a service hot water load of 10 percent or more of total building energy loads, as shown with an energy analysis as described in Section C407.

C406.7.2 Recovered or renewable water heating. The building service water-heating system shall have one or more of the following that are sized to provide not less than 30 percent of the building's annual hot water requirements, or sized to provide 70 percent of the building's annual hot water requirements if the building is required to comply with Section C403.10.5:

1. Waste heat recovery from service hot water, heat-recovery chillers, building equipment or process equipment.
2. *On-site renewable energy* water-heating systems.

TABLE C406.1(5)
ADDITIONAL ENERGY EFFICIENCY CREDITS FOR OTHER[a] OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	1	1	1	1	1	2	1	2	1	2	2	3	3
C406.2.2: 5% cooling efficiency improvement	5	5	4	4	3	3	2	2	2	1	1	2	1	1	1	1	1
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	1	1	1	1	2	2	3	3	3	3	4	3	5	5
C406.2.4: 10% cooling efficiency improvement	8	9	8	7	5	5	3	4	4	2	2	3	2	2	2	2	2
C406.3: Reduced lighting power	8	8	9	9	9	9	10	8	9	9	7	8	8	8	8	8	7
C406.4: Enhanced digital lighting controls	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	1
C406.5: On-site renewable energy	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7	7	7
C406.6: Dedicated outdoor air system	3	4	3	3	4	3	2	5	3	3	5	4	3	7	5	7	6
C406.7.2: Recovered or renewable water heating[b]	10	9	11	10	13	12	15	14	14	15	14	14	16	14	15	15	15
C406.7.3: Efficient fossil fuel water heater[b]	5	5	6	6	8	7	8	8	8	9	9	9	10	10	9	10	11
C406.7.4: Heat pump water heater[b]	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
C406.8: Enhanced envelope performance	3	6	3	4	3	4	1	5	4	3	5	5	4	7	6	9	10
C406.9: Reduced air infiltration	3	2	2	4	4	2	NA	6	2	2	6	4	1	10	5	7	4
C406.10: Energy monitoring	3	3	3	3	3	3	3	3	3	3	2	3	2	2	2	3	2
C406.11: Fault detection and diagnostics system	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1

NA = Not Applicable.

a. Other occupancy groups include all groups except Groups B, E, I, M and R.

b. For occupancy groups listed in Section C406.7.1.

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C406.7.3 Efficient fossil fuel water heater. The combined input-capacity weighted-average equipment rating of all fossil fuel water-heating equipment in the building shall be not less than 95 percent Et or 0.95 EF. This option shall receive only half the listed credits for buildings required to comply with Section C404.2.1.

C406.7.4 Heat pump water heater. Where electric resistance water heaters are allowed, all service hot water system heating requirements shall be met using heat pump technology with a combined input-capacity weighted-average EF of 3.0. Air-source heat pump water heaters shall not draw conditioned air from within the building, except exhaust air that would otherwise be exhausted to the exterior.

C406.8 Enhanced envelope performance. The total UA of the *building thermal envelope* as designed shall be not less than 15 percent below the total UA of the *building thermal envelope* in accordance with Section C402.1.5.

C406.9 Reduced air infiltration. Air infiltration shall be verified by whole-building pressurization testing conducted in accordance with ASTM E779 or ASTM E1827 by an independent third party. The measured air-leakage rate of the building envelope shall not exceed 0.25 cfm/ft^2 (2.0 L/s × m^2) under a pressure differential of 0.3 inches water column (75 Pa), with the calculated surface area being the sum of the above- and below-grade building envelope. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner.

Exception: For buildings having over 250,000 square feet (25 000 m^2) of *conditioned floor area*, air leakage testing need not be conducted on the whole building where testing is conducted on representative above-grade sections of the building. Tested areas shall total not less than 25 percent of the conditioned floor area and shall be tested in accordance with this section.

C406.10 Energy monitoring. Buildings shall be equipped to measure, monitor, record and report energy consumption data in compliance with Sections C406.10.1 through C406.10.5.

C406.10.1 Electrical energy metering. For all electrical energy supplied to the building and its associated site, including but not limited to site lighting, parking, recreational facilities, and other areas that serve the building and its occupants, meters or other measurement devices shall be provided to collect energy consumption data for each end-use category required by Section C406.10.2.

C406.10.2 End-use metering categories. Meters or other *approved* measurement devices shall be provided to collect energy use data for each end-use category listed in Table 406.10.2. These meters shall have the capability to collect energy consumption data for the whole building or for each separately metered portion of the building. Where multiple meters are used to measure any end-use category, the data acquisition system shall total all of the energy used by that category. Not more than 5 percent of the measured load for each of the end-use categories listed in Table 406.10.2 is permitted to be from a load not within the category.

Exceptions:

1. HVAC and water-heating equipment serving only an individual dwelling unit does not require end-use metering.
2. End-use metering is not required for fire pumps, stairwell pressurization fans or any system that operates only during testing or emergency.

TABLE C406.10.2
ENERGY USE CATEGORIES

LOAD CATEGORY	DESCRIPTION OF ENERGY USE
Total HVAC system	Heating, cooling and ventilation, including but not limited to fans, pumps, boilers, chillers and water heating. Energy used by 120-volt equipment, or by 208/120-volt equipment that is located in a building where the main service is 480/277-volt power, is permitted to be excluded from total HVAC system energy use.
Interior lighting	Lighting systems located within the building.
Exterior lighting	Lighting systems located on the building site but not within the building.
Plug loads	Devices, appliances and equipment connected to convenience receptacle outlets.
Process loads	Any single load that is not included in an HVAC, lighting or plug load category and that exceeds 5 percent of the peak connected load of the whole building, including but not limited to data centers, manufacturing equipment and commercial kitchens.
Building operations and other miscellaneous loads	The remaining loads not included elsewhere in this table, including but not limited to vertical transportation systems and automatic doors.

C406.10.3 Meters. Meters or other measurement devices required by this section shall be configured to automatically communicate energy consumption data to the data acquisition system required by Section C406.10.4. Source meters shall be allowed to be any digital-type meter. Lighting, HVAC or other building systems that can monitor their energy consumption shall be permitted instead of meters. Current sensors shall be permitted, provided that they have a tested accuracy of ±2 percent. Required metering systems and equipment shall have the capability to provide at least hourly data that is fully integrated into the data acquisition system and graphical energy report in accordance with Sections C406.10.4 and C406.10.5.

C406.10.4 Data acquisition system. A data acquisition system shall have the capability to store the data from the required meters and other sensing devices for a minimum of 36 months. The data acquisition system shall have the capability to store real-time energy consumption data and provide hourly, daily, monthly and yearly logged data for each end-use category required by Section C406.10.2.

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C406.10.5 Graphical energy report. A permanent and readily accessible reporting mechanism shall be provided in the building that is accessible by building operation and management personnel. The reporting mechanism shall have the capability to graphically provide the energy consumption for each end-use category required by Section C406.10.2 at least every hour, day, month and year for the previous 36 months.

C406.11 Fault detection and diagnostics system. A fault detection and diagnostics system shall be installed to monitor the HVAC system's performance and automatically identify faults. The system shall do all of the following:

1. Include permanently installed sensors and devices to monitor the HVAC system's performance.
2. Sample the HVAC system's performance at least once every 15 minutes.
3. Automatically identify and report HVAC system faults.
4. Automatically notify authorized personnel of identified HVAC system faults.
5. Automatically provide prioritized recommendations for repair of identified faults based on analysis of data collected from the sampling of the HVAC system performance.
6. Be capable of transmitting the prioritized fault repair recommendations to remotely located authorized personnel.

C406.12 Efficient kitchen equipment. For buildings and spaces designated as Group A-2 or facilities that include a commercial kitchen with at least one gas or electric fryer, all fryers, dishwashers, steam cookers and ovens shall comply with all of the following:

1. Achieve performance levels in accordance with the equipment specifications listed in Tables C406.12(1) through C406.12(4) when rated in accordance with the applicable test procedure.
2. Be installed prior to the issuance of the Certificate of Occupancy.
3. Have associated performance levels listed on the construction documents submitted for permitting.

Energy efficiency credits for efficient kitchen equipment shall be independent of climate zone and determined based on Equation 4-15, rounded to the nearest whole number.

$$AEEC_K = 20 \times Area_K / Area_B \quad \textbf{(Equation 4-15)}$$

where:

$AEEC_K$ = Section C406.12 additional energy efficiency credits.

$Area_K$ = Floor area of full-service kitchen (ft² or m²).

$Area_B$ = Gross floor area of building (ft² or m²).

TABLE C406.12(1)
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL FRYERS

FRYER TYPE	HEAVY-LOAD COOKING ENERGY EFFICIENCY	IDLE ENERGY RATE	TEST PROCEDURE
Standard open deep-fat gas fryers	≥ 50%	≤ 9,000 Btu/h	ASTM F1361
Standard open deep-fat electric fryers	≥ 83%	≤ 800 watts	
Large-vat open deep-fat gas fryers	≥ 50%	≤ 12,000 Btu/h	ASTM F2144
Large-vat open deep-fat electric fryers	≥ 80%	≤ 1,100 watts	

For SI: 1 Btu/h = 0.293/W.

TABLE C406.12(2)
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL STEAM COOKERS

FUEL TYPE	PAN CAPACITY	COOKING ENERGY EFFICIENCY[a]	IDLE ENERGY RATE	TEST PROCEDURE
Electric steam	3-pan	50%	400 watts	ASTM F1484
	4-pan	50%	530 watts	
	5-pan	50%	670 watts	
	6-pan and larger	50%	800 watts	
Gas steam	3-pan	38%	6,250 Btu/h	
	4-pan	38%	8,350 Btu/h	
	5-pan	38%	10,400 Btu/h	
	6-pan and larger	38%	12,500 Btu/h	

For SI: Btu/h = 0.293/W.

a. Cooking energy efficiency is based on heavy load (potato) cooking capacity.

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TABLE C406.12(3)
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL DISHWASHERS

MACHINE TYPE	HIGH-TEMPERATURE EFFICIENCY REQUIREMENTS		LOW-TEMPERATURE EFFICIENCY REQUIREMENTS		TEST PROCEDURE
	Idle energy rate[a]	Water consumption[b]	Idle energy rate[a]	Water consumption[b]	
Under counter	≤ .50 kW	≤ 0.86 GPR	≤ 0.50 kW	≤ 1.19 GPR	ASTM F1696 ASTM F1920
Stationary single-tank door	≤ .70 kW	≤ 0.89 GPR	≤ 0.60 kW	≤ 1.18 GPR	
Pot, pan and utensil	≤ 1.20 kW	≤ 0.58 GPR	≤ 1.00 kW	≤ 0.58 GPSF	
Single-tank conveyor	≤ 1.50 kW	≤ 0.70 GPR	≤ 1.50 kW	≤ 0.79 GPR	
Multiple-tank conveyor	≤ 2.25 kW	≤ 0.54 GPR	≤ 2.00 kW	≤ 0.54 GPR	
Single-tank flight	Reported	GPH ≤ 2.975x + 55.00	Reported	GPH ≤ 2.975x + 55.00	
Multiple-tank flight	Reported	GPH ≤ 4.96x + 17.00	Reported	GPH ≤ 4.96x + 17.00	

a. Idle results shall be measured with the door closed and represent the total idle energy consumed by the machine, including all tank heaters and controls. Booster heater (internal or external) energy consumption shall not be part of this measurement unless it cannot be separately monitored.
b. GPR = gallons per rack, GPSF = gallons per square foot of rack, GPH = gallons per hour, x = maximum conveyor belt speed (feet/minute) × conveyor belt width (feet).

TABLE C406.12(4)
MINIMUM EFFICIENCY REQUIREMENTS: COMMERCIAL OVENS

FUEL TYPE	CLASSIFICATION	IDLE RATE	COOKING-ENERGY EFFICIENCY, %	TEST PROCEDURE
Convection ovens				
Gas	Full-size	≤ 12,000 Btu/h	≥ 46	ASTM F1496
Electric	Half-size	≤ 1.0 Btu/h	≥ 71	
	Full-size	≤ 1.60 Btu/h		
Combination ovens				
Gas	Steam mode	≤ 200P^a + 6,511 Btu/h	≥ 41	ASTM F2861
	Convection mode	≤ 150P^a + 5,425 Btu/h	≥ 56	
Electric	Steam mode	≤ 0.133P^a + 0.6400 kW	≥ 55	
	Convection mode	≤ 0.080P^a + 0.4989 kW	≥ 76	
Rack ovens				
Gas	Single	≤ 25,000 Btu/h	≥ 48	ASTM F2093
	Double	≤ 30,000 Btu/h	≥ 52	

For SI: 1 Btu/h = 0.293/W.
a. P = Pan Capacity: the number of steam table pans the combination oven is able to accommodate in accordance with ASTM F1495.

SECTION C407
TOTAL BUILDING PERFORMANCE

C407.1 Scope. This section establishes criteria for compliance using total building performance. The following systems and loads shall be included in determining the total building performance: heating systems, cooling systems, service water heating, fan systems, lighting power, receptacle loads and process loads.

Exception: Energy used to recharge or refuel vehicles that are used for on-road and off-site transportation purposes.

C407.2 Mandatory requirements. Compliance based on total building performance requires that a proposed design meet all of the following:

1. The requirements of the sections indicated within Table C407.2.
2. An annual energy cost that is less than or equal to 80 percent of the annual energy cost of the *standard reference design*. Energy prices shall be taken from a source *approved* by the *code official*, such as the Department of Energy, Energy Information Administration's *State Energy Data System Prices and*

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Expenditures reports. *Code officials* shall be permitted to require time-of-use pricing in energy cost calculations. The reduction in energy cost of the proposed design associated with *on-site renewable energy* shall be not more than 5 percent of the total energy cost. The amount of renewable energy purchased from off-site sources shall be the same in the *standard reference design* and the *proposed design*.

Exception: Jurisdictions that require site energy (1 kWh = 3413 Btu) rather than energy cost as the metric of comparison.

TABLE C407.2
REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION[a]	TITLE
Envelope	
C402.5	Air leakage—thermal envelope
Mechanical	
C403.1.1	Calculation of heating and cooling loads
C403.1.2	Data centers
C403.2	System design
C403.3	Heating and cooling equipment efficiencies
C403.4, except C403.4.3, C403.4.4 and C403.4.5	Heating and cooling system controls
C403.5.5	Economizer fault detection and diagnostics
C403.7, except C403.7.4.1	Ventilation and exhaust systems
C403.8, except C403.8.6	Fan and fan controls
C403.9	Large-diameter ceiling fans
C403.11, except C403.11.3	Refrigeration equipment performance
C403.12	Construction of HVAC system elements
C403.13	Mechanical systems located outside of the building thermal envelope
C404	Service water heating
C405, except C405.3	Electrical power and lighting systems
C408	Maintenance information and system commisioning

a. Reference to a code section includes all the relative subsections except as indicated in the table.

C407.3 Documentation. Documentation verifying that the methods and accuracy of compliance software tools conform to the provisions of this section shall be provided to the *code official.*

C407.3.1 Compliance report. Permit submittals shall include a report documenting that the proposed design has annual energy costs less than or equal to the annual energy costs of the standard reference design. The compliance documentation shall include the following information:

1. Address of the building.
2. An inspection checklist documenting the building component characteristics of the *proposed design* as specified in Table C407.4.1(1). The inspection checklist shall show the estimated annual energy cost for both the *standard reference design* and the *proposed design*.
3. Name of individual completing the compliance report.
4. Name and version of the compliance software tool.

C407.3.2 Additional documentation. The *code official* shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the *standard reference design*.
2. Thermal zoning diagrams consisting of floor plans showing the thermal zoning scheme for *standard reference design* and *proposed design*.
3. Input and output reports from the energy analysis simulation program containing the complete input and output files, as applicable. The output file shall include energy use totals and energy use by energy source and end-use served, total hours that space conditioning loads are not met and any errors or warning messages generated by the simulation tool as applicable.
4. An explanation of any error or warning messages appearing in the simulation tool output.
5. A certification signed by the builder providing the building component characteristics of the *proposed design* as given in Table C407.4.1(1).
6. Documentation of the reduction in energy use associated with *on-site renewable energy*.

C407.4 Calculation procedure. Except as specified by this section, the *standard reference design* and *proposed design* shall be configured and analyzed using identical methods and techniques.

C407.4.1 Building specifications. The *standard reference design* and *proposed design* shall be configured and analyzed as specified by Table C407.4.1(1). Table C407.4.1(1) shall include by reference all notes contained in Table C402.1.4.

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TABLE C407.4.1(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT CHARACTERISTICS	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Space use classification	Same as proposed	The space use classification shall be chosen in accordance with Table C405.3.2(1) or C405.3.2(2) for all areas of the building covered by this permit. Where the space use classification for a building is not known, the building shall be categorized as an office building.
Roofs	Type: insulation entirely above deck	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table C402.1.4	As proposed
	Solar absorptance: 0.75	As proposed
	Emittance: 0.90	As proposed
Walls, above-grade	Type: same as proposed	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table C402.1.4	As proposed
	Solar absorptance: 0.75	As proposed
	Emittance: 0.90	As proposed
Walls, below-grade	Type: mass wall	As proposed
	Gross area: same as proposed	As proposed
	U-Factor: as specified in Table C402.1.4 with insulation layer on interior side of walls	As proposed
Floors, above-grade	Type: joist/framed floor	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table C402.1.4	As proposed
Floors, slab-on-grade	Type: unheated	As proposed
	F-factor: as specified in Table C402.1.4	As proposed
Opaque doors	Type: swinging	As proposed
	Area: Same as proposed	As proposed
	U-factor: as specified in Table C402.1.4	As proposed
Vertical fenestration other than opaque doors	Area 1. The proposed vertical fenestration area; where the proposed vertical fenestration area is less than 40 percent of above-grade wall area. 2. 40 percent of above-grade wall area; where the proposed vertical fenestration area is 40 percent or more of the above-grade wall area.	As proposed
	U-factor: as specified in Table C402.4	As proposed
	SHGC: as specified in Table C402.4 except that for climates with no requirement (NR) SHGC = 0.40 shall be used	As proposed
	External shading and PF: none	As proposed

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TABLE C407.4.1(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT CHARACTERISTICS	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Skylights	Area 1. The proposed skylight area; where the proposed skylight area is less than that permitted by Section C402.1. 2. The area permitted by Section C402.1; where the proposed skylight area exceeds that permitted by Section C402.1.	As proposed
	U-factor: as specified in Table C402.4	As proposed
	SHGC: as specified in Table C402.4 except that for climates with no requirement (NR) SHGC = 0.40 shall be used.	As proposed
Lighting, interior	The interior lighting power shall be determined in accordance with Section C405.3.2. Where the occupancy of the building is not known, the lighting power density shall be 1.0 watt per square foot based on the categorization of buildings with unknown space classification as offices.	As proposed
Lighting, exterior	The lighting power shall be determined in accordance with Tables C405.5.2(1), C405.5.2(2) and C405.5.2(3). Areas and dimensions of surfaces shall be the same as proposed.	As proposed
Internal gains	Same as proposed	Receptacle, motor and process loads shall be modeled and estimated based on the space use classification. End-use load components within and associated with the building shall be modeled to include, but not be limited to, the following: exhaust fans, parking garage ventilation fans, exterior building lighting, swimming pool heaters and pumps, elevators, escalators, refrigeration equipment and cooking equipment.
Schedules	Same as proposed **Exception:** Thermostat settings and schedules for HVAC systems that utilize radiant heating, radiant cooling and elevated air speed, provided that equivalent levels of occupant thermal comfort are demonstrated by means of equal Standard Effective Temperature as calculated in Normative Appendix B of ASHRAE Standard 55.	Operating schedules shall include hourly profiles for daily operation and shall account for variations between weekdays, weekends, holidays and any seasonal operation. Schedules shall model the time-dependent variations in occupancy, illumination, receptacle loads, thermostat settings, mechanical ventilation, HVAC equipment availability, service hot water usage and any process loads. The schedules shall be typical of the proposed building type as determined by the designer and approved by the jurisdiction.
Mechanical ventilation	Same as proposed	As proposed, in accordance with Section C403.2.2.
Heating systems	Fuel type: same as proposed design	As proposed
	Equipment type[a]: as specified in Tables C407.4.1(2) and C407.4.1(3)	As proposed
	Efficiency: as specified in the tables in Section C403.3.2.	As proposed
	Capacity[b]: sized proportionally to the capacities in the proposed design based on sizing runs, and shall be established such that no smaller number of unmet heating load hours and no larger heating capacity safety factors are provided than in the proposed design.	As proposed

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TABLE C407.4.1(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT CHARACTERISTICS	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Cooling systems	Fuel type: same as proposed design	As proposed
	Equipment type[c]: as specified in Tables C407.4.1(2) and C407.4.1(3)	As proposed
	Efficiency: as specified in Tables C403.3.2(1), C403.3.2(2) and C403.3.2(3)	As proposed
	Capacity[b]: sized proportionally to the capacities in the proposed design based on sizing runs, and shall be established such that no smaller number of unmet cooling load hours and no larger cooling capacity safety factors are provided than in the proposed design.	As proposed
	Economizer[d]: same as proposed, in accordance with Section C403.5.	As proposed
Service water heating[e]	Fuel type: same as proposed	As proposed
	Efficiency: as specified in Table C404.2	For Group R, as proposed multiplied by SWHF. For other than Group R, as proposed multiplied by efficiency as provided by the manufacturer of the DWHR unit.
	Capacity: same as proposed	As proposed
	Where no service water hot water system exists or is specified in the proposed design, no service hot water heating shall be modeled.	

For SI: 1 watt per square foot = 10.7 w/m^2.

SWHF = Service Water Heat Recovery factor, DWHR = Drain Water Heat Recovery.

a. Where no heating system exists or has been specified, the heating system shall be modeled as fossil fuel. The system characteristics shall be identical in both the standard reference design and proposed design.

b. The ratio between the capacities used in the annual simulations and the capacities determined by sizing runs shall be the same for both the standard reference design and proposed design.

c. Where no cooling system exists or no cooling system has been specified, the cooling system shall be modeled as an air-cooled single-zone system, one unit per thermal zone. The system characteristics shall be identical in both the standard reference design and proposed design.

d. If an economizer is required in accordance with Table C403.5(1) and where no economizer exists or is specified in the proposed design, then a supply-air economizer shall be provided in the standard reference design in accordance with Section C403.5.

e. The SWHF shall be applied as follows:
   1. Where potable water from the DWHR unit supplies not less than one shower and not greater than two showers, of which the drain water from the same showers flows through the DWHR unit then SWHF = [1 – (DWHR unit efficiency × 0.36)].
   2. Where potable water from the DWHR unit supplies not less than three showers and not greater than four showers, of which the drain water from the same showers flows through the DWHR unit then SWHF = [1 – (DWHR unit efficiency × 0.33)].
   3. Where potable water from the DWHR unit supplies not less than five showers and not greater than six showers, of which the drain water from the same showers flows through the DWHR unit, then SWHF = [1 – (DWHR unit efficiency × 0.26)].
   4. Where Items 1 through 3 are not met, SWHF = 1.0.

C407.4.2 Thermal blocks. The *standard reference design* and *proposed design* shall be analyzed using identical thermal blocks as specified in Section C407.4.2.1, C407.4.2.2 or C407.4.2.3.

C407.4.2.1 HVAC zones designed. Where HVAC *zones* are defined on HVAC design drawings, each HVAC *zone* shall be modeled as a separate thermal block.

Exception: Different HVAC *zones* shall be allowed to be combined to create a single thermal block or identical thermal blocks to which multipliers are applied, provided that:

1. The space use classification is the same throughout the thermal block.
2. All HVAC *zones* in the thermal block that are adjacent to glazed exterior walls face the same orientation or their orientations are within 45 degrees (0.79 rad) of each other.
3. All of the *zones* are served by the same HVAC system or by the same kind of HVAC system.

C407.4.2.2 HVAC zones not designed. Where HVAC *zones* have not yet been designed, thermal blocks shall be defined based on similar internal load densities, occupancy, lighting, thermal and temperature schedules, and in combination with the following guidelines:

1. Separate thermal blocks shall be assumed for interior and perimeter spaces. Interior spaces shall be those located more than 15 feet (4572 mm) from an exterior wall. Perimeter spaces

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TABLE C407.4.1(2)
HVAC SYSTEMS MAP

CONDENSER COOLING SOURCE[a]	HEATING SYSTEM CLASSIFICATION[b]	STANDARD REFERENCE DESIGN HVC SYSTEM TYPE[c]		
		Single-zone Residential System	Single-zone Nonresidential System	All Other
Water/ground	Electric resistance	System 5	System 5	System 1
	Heat pump	System 6	System 6	System 6
	Fossil fuel	System 7	System 7	System 2
Air/none	Electric resistance	System 8	System 9	System 3
	Heat pump	System 8	System 9	System 3
	Fossil fuel	System 10	System 11	System 4

a. Select "water/ground" where the proposed design system condenser is water or evaporatively cooled; select "air/none" where the condenser is air cooled. Closed-circuit dry coolers shall be considered to be air cooled. Systems utilizing district cooling shall be treated as if the condenser water type were "water." Where mechanical cooling is not specified or the mechanical cooling system in the proposed design does not require heat rejection, the system shall be treated as if the condenser water type were "Air." For proposed designs with ground-source or groundwater-source heat pumps, the standard reference design HVAC system shall be water-source heat pump (System 6).

b. Select the path that corresponds to the proposed design heat source: electric resistance, heat pump (including air source and water source), or fuel fired. Systems utilizing district heating (steam or hot water) and systems without heating capability shall be treated as if the heating system type were "fossil fuel." For systems with mixed fuel heating sources, the system or systems that use the secondary heating source type (the one with the smallest total installed output capacity for the spaces served by the system) shall be modeled identically in the standard reference design and the primary heating source type shall be used to determine standard reference design HVAC system type.

c. Select the standard reference design HVAC system category: The system under "single-zone residential system" shall be selected where the HVAC system in the proposed design is a single-zone system and serves a Group R occupancy. The system under "single-zone nonresidential system" shall be selected where the HVAC system in the proposed design is a single-zone system and serves other than Group R occupancy. The system under "all other" shall be selected for all other cases.

shall be those located closer than 15 feet (4572 mm) from an *exterior wall*.

2. Separate thermal blocks shall be assumed for spaces adjacent to glazed exterior walls: a separate *zone* shall be provided for each orientation, except orientations that differ by not more than 45 degrees (0.79 rad) shall be permitted to be considered to be the same orientation. Each *zone* shall include floor area that is 15 feet (4572 mm) or less from a glazed perimeter wall, except that floor area within 15 feet (4572 mm) of glazed perimeter walls having more than one orientation shall be divided proportionately between *zones*.
3. Separate thermal blocks shall be assumed for spaces having floors that are in contact with the ground or exposed to ambient conditions from *zones* that do not share these features.
4. Separate thermal blocks shall be assumed for spaces having exterior ceiling or roof assemblies from *zones* that do not share these features.

C407.4.2.3 Group R-2 occupancy buildings. Group R-2 occupancy spaces shall be modeled using one thermal block per space except that those facing the same orientations are permitted to be combined into one thermal block. Corner units and units with roof or floor loads shall only be combined with units sharing these features.

C407.5 Calculation software tools. Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the *standard reference design* and the *proposed design* and shall include the following capabilities.

1. Building operation for a full calendar year (8,760 hours).
2. Climate data for a full calendar year (8,760 hours) and shall reflect *approved* coincident hourly data for temperature, solar radiation, humidity and wind speed for the building location.
3. Ten or more thermal zones.
4. Thermal mass effects.
5. Hourly variations in occupancy, illumination, receptacle loads, thermostat settings, mechanical ventilation, HVAC equipment availability, service hot water usage and any process loads.
6. Part-load performance curves for mechanical equipment.
7. Capacity and efficiency correction curves for mechanical heating and cooling equipment.
8. Printed *code official* inspection checklist listing each of the *proposed design* component characteristics from Table C407.4.1(1) determined by the analysis to provide compliance, along with their respective performance ratings, including but not limited to *R*-value, *U*-factor, SHGC, HSPF, AFUE, SEER and EF.

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TABLE C407.4.1(3)
SPECIFICATIONS FOR THE STANDARD REFERENCE DESIGN HVAC SYSTEM DESCRIPTIONS

SYSTEM NO.	SYSTEM TYPE	FAN CONTROL	COOLING TYPE	HEATING TYPE
1	Variable air volume with parallel fan-powered boxes[a]	VAV[d]	Chilled water[e]	Electric resistance
2	Variable air volume with reheat[b]	VAV[d]	Chilled water[e]	Hot water fossil fuel boiler[f]
3	Packaged variable air volume with parallel fan-powered boxes[a]	VAV[d]	Direct expansion[c]	Electric resistance
4	Packaged variable air volume with reheat[b]	VAV[d]	Direct expansion[c]	Hot water fossil fuel boiler[f]
5	Two-pipe fan coil	Constant volume[i]	Chilled water[e]	Electric resistance
6	Water-source heat pump	Constant volume[i]	Direct expansion[c]	Electric heat pump and boiler[g]
7	Four-pipe fan coil	Constant volume[i]	Chilled water[e]	Hot water fossil fuel boiler[f]
8	Packaged terminal heat pump	Constant volume[i]	Direct expansion[c]	Electric heat pump[h]
9	Packaged rooftop heat pump	Constant volume[i]	Direct expansion[c]	Electric heat pump[h]
10	Packaged terminal air conditioner	Constant volume[i]	Direct expansion	Hot water fossil fuel boiler[f]
11	Packaged rooftop air conditioner	Constant volume[i]	Direct expansion	Fossil fuel furnace

For SI: 1 foot = 304.8 mm, 1 cfm = 0.4719 L/s, 1 Btu/h = 0.293/W, °C = [(°F) – 32]/1.8.

a. **VAV with parallel boxes:** Fans in parallel VAV fan-powered boxes shall be sized for 50 percent of the peak design flow rate and shall be modeled with 0.35 W/cfm fan power. Minimum volume setpoints for fan-powered boxes shall be equal to the minimum rate for the space required for ventilation consistent with Section C403.6.1, Item 3. Supply air temperature setpoint shall be constant at the design condition.

b. **VAV with reheat:** Minimum volume setpoints for VAV reheat boxes shall be 0.4 cfm/ft^2 of floor area. Supply air temperature shall be reset based on zone demand from the design temperature difference to a 10°F temperature difference under minimum load conditions. Design airflow rates shall be sized for the reset supply air temperature; i.e., a 10°F temperature difference.

c. **Direct expansion:** The fuel type for the cooling system shall match that of the cooling system in the proposed design.

d. **VAV:** Where the proposed design system has a supply, return or relief fan motor 25 hp or larger, the corresponding fan in the VAV system of the standard reference design shall be modeled assuming a variable-speed drive. For smaller fans, a forward-curved centrifugal fan with inlet vanes shall be modeled. Where the proposed design's system has a direct digital control system at the zone level, static pressure setpoint reset based on zone requirements in accordance with Section C403.8.6 shall be modeled.

e. **Chilled water:** For systems using purchased chilled water, the chillers are not explicitly modeled and chilled water costs shall be based as determined in Sections C407.2 and C407.4.2. Otherwise, the standard reference design's chiller plant shall be modeled with chillers having the number as indicated in Table C407.4.1(4) as a function of standard reference building chiller plant load and type as indicated in Table C407.4.1(5) as a function of individual chiller load. Where chiller fuel source is mixed, the system in the standard reference design shall have chillers with the same fuel types and with capacities having the same proportional capacity as the proposed design's chillers for each fuel type. Chilled water supply temperature shall be modeled at 44°F design supply temperature and 56°F return temperature. Piping losses shall not be modeled in either building model. Chilled water supply water temperature shall be reset in accordance with Section C403.4.4. Pump system power for each pumping system shall be the same as the proposed design; where the proposed design has no chilled water pumps, the standard reference design pump power shall be 22 W/gpm (equal to a pump operating against a 75-foot head, 65-percent combined impeller and motor efficiency). The chilled water system shall be modeled as primary-only variable flow with flow maintained at the design rate through each chiller using a bypass. Chilled water pumps shall be modeled as riding the pump curve or with variable-speed drives where required in Section C403.4.4. The heat rejection device shall be an axial fan cooling tower with two-speed fans where required in Section C403.10. Condenser water design supply temperature shall be 85°F or 10°F approach to design wet-bulb temperature, whichever is lower, with a design temperature rise of 10°F. The tower shall be controlled to maintain a 70°F leaving water temperature where weather permits, floating up to leaving water temperature at design conditions. Pump system power for each pumping system shall be the same as the proposed design; where the proposed design has no condenser water pumps, the standard reference design pump power shall be 19 W/gpm (equal to a pump operating against a 60-foot head, 60-percent combined impeller and motor efficiency). Each chiller shall be modeled with separate condenser water and chilled water pumps interlocked to operate with the associated chiller.

f. **Fossil fuel boiler:** For systems using purchased hot water or steam, the boilers are not explicitly modeled and hot water or steam costs shall be based on actual utility rates. Otherwise, the boiler plant shall use the same fuel as the proposed design and shall be natural draft. The standard reference design boiler plant shall be modeled with a single boiler where the standard reference design plant load is 600,000 Btu/h and less and with two equally sized boilers for plant capacities exceeding 600,000 Btu/h. Boilers shall be staged as required by the load. Hot water supply temperature shall be modeled at 180°F design supply temperature and 130°F return temperature. Piping losses shall not be modeled in either building model. Hot water supply water temperature shall be reset in accordance with Section C403.4.4. Pump system power for each pumping system shall be the same as the proposed design; where the proposed design has no hot water pumps, the standard reference design pump power shall be 19 W/gpm (equal to a pump operating against a 60-foot head, 60-percent combined impeller and motor efficiency). The hot water system shall be modeled as primary only with continuous variable flow. Hot water pumps shall be modeled as riding the pump curve or with variable speed drives where required by Section C403.4.4.

(continued)

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TABLE C407.4.1(3)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE DESIGN HVAC SYSTEM DESCRIPTIONS

g. **Electric heat pump and boiler:** Water-source heat pumps shall be connected to a common heat pump water loop controlled to maintain temperatures between 60°F and 90°F. Heat rejection from the loop shall be provided by an axial fan closed-circuit evaporative fluid cooler with two-speed fans where required in Section C403.8.6. Heat addition to the loop shall be provided by a boiler that uses the same fuel as the proposed design and shall be natural draft. Where no boilers exist in the proposed design, the standard reference building boilers shall be fossil fuel. The standard reference design boiler plant shall be modeled with a single boiler where the standard reference design plant load is 600,000 Btu/h or less and with two equally sized boilers for plant capacities exceeding 600,000 Btu/h. Boilers shall be staged as required by the load. Piping losses shall not be modeled in either building model. Pump system power shall be the same as the proposed design; where the proposed design has no pumps, the standard reference design pump power shall be 22 W/gpm, which is equal to a pump operating against a 75-foot head, with a 65-percent combined impeller and motor efficiency. Loop flow shall be variable with flow shutoff at each heat pump when its compressor cycles off as required by Section C403.4.4. Loop pumps shall be modeled as riding the pump curve or with variable speed drives where required by Section C403.10.

h. **Electric heat pump:** Electric air-source heat pumps shall be modeled with electric auxiliary heat. The system shall be controlled with a multistage space thermostat and an outdoor air thermostat wired to energize auxiliary heat only on the last thermostat stage and when outdoor air temperature is less than 40°F.

i. **Constant volume:** Fans shall be controlled in the same manner as in the proposed design; i.e., fan operation whenever the space is occupied or fan operation cycled on calls for heating and cooling. Where the fan is modeled as cycling and the fan energy is included in the energy efficiency rating of the equipment, fan energy shall not be modeled explicitly.

TABLE C407.5.1(4)
NUMBER OF CHILLERS

TOTAL CHILLER PLANT CAPACITY	NUMBER OF CHILLERS
≤ 300 tons	1
> 300 tons, < 600 tons	2, sized equally
≥ 600 tons	2 minimum, with chillers added so that all are sized equally and none is larger than 800 tons

For SI: 1 ton = 3517 W.

TABLE C407.5.1(5)
WATER CHILLER TYPES

INDIVIDUAL CHILLER PLANT CAPACITY	ELECTRIC CHILLER TYPE	FOSSIL FUEL CHILLER TYPE
≤ 100 tons	Reciprocating	Single-effect absorption, direct fired
> 100 tons, < 300 tons	Screw	Double-effect absorption, direct fired
≥ 300 tons	Centrifugal	Double-effect absorption, direct fired

For SI: 1 ton = 3517 W.

C407.5.1 Specific approval. Performance analysis tools complying with the applicable subsections of Section C407 and tested according to ASHRAE Standard 140 shall be permitted to be *approved.* Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall be permitted to approve tools for a specified application or limited scope.

C407.5.2 Input values. Where calculations require input values not specified by Sections C402, C403, C404 and C405, those input values shall be taken from an *approved* source.

C407.5.3 Exceptional calculation methods. Where the simulation program does not model a design, material or device of the *proposed design*, an exceptional calculation method shall be used where approved by the *code official*. Where there are multiple designs, materials or devices that the simulation program does not model, each shall be calculated separately and exceptional savings determined for each. The total exceptional savings shall not constitute more than half of the difference between the baseline building performance and the proposed building performance. Applications for approval of an exceptional method shall include all of the following:

1. Step-by-step documentation of the exceptional calculation method performed, detailed enough to reproduce the results.
2. Copies of all spreadsheets used to perform the calculations.
3. A sensitivity analysis of energy consumption where each of the input parameters is varied from half to double the value assumed.
4. The calculations shall be performed on a time step basis consistent with the simulation program used.
5. The performance rating calculated with and without the exceptional calculation method.

SECTION C408
MAINTENANCE INFORMATION AND SYSTEM COMMISSIONING

C408.1 General. This section covers the provision of maintenance information and the commissioning of, and the functional testing requirements for, building systems.

C408.1.1 Building operations and maintenance information. The building operations and maintenance documents shall be provided to the owner and shall consist of manufacturers' information, specifications and recommendations; programming procedures and data points; narratives; and other means of illustrating to the owner how the building, equipment and systems are intended to be installed, maintained and operated. Required regular maintenance actions for equipment and systems shall be clearly stated on a readily visible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.

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C408.2 Mechanical systems and service water-heating systems commissioning and completion requirements. Prior to the final mechanical and plumbing inspections, the *registered design professional or approved agency* shall provide evidence of mechanical systems *commissioning* and completion in accordance with the provisions of this section.

Construction document notes shall clearly indicate provisions for *commissioning* and completion requirements in accordance with this section and are permitted to refer to specifications for further requirements. Copies of all documentation shall be given to the owner or owner's authorized agent and made available to the *code official* upon request in accordance with Sections C408.2.4 and C408.2.5.

Exceptions: The following systems are exempt:

1. Mechanical systems and service water-heating systems in buildings where the total mechanical equipment capacity is less than 480,000 Btu/h (140.7 kW) cooling capacity and 600,000 Btu/h (175.8 kW) combined service water-heating and space-heating capacity.
2. Systems included in Section C403.5 that serve individual *dwelling units* and *sleeping units*.

C408.2.1 Commissioning plan. A *commissioning plan* shall be developed by a *registered design professional* or *approved agency* and shall include the following items:

1. A narrative description of the activities that will be accomplished during each phase of *commissioning,* including the personnel intended to accomplish each of the activities.
2. A listing of the specific equipment, appliances or systems to be tested and a description of the tests to be performed.
3. Functions to be tested including, but not limited to, calibrations and economizer controls.
4. Conditions under which the test will be performed. Testing shall affirm winter and summer design conditions and full outside air conditions.
5. Measurable criteria for performance.

C408.2.2 Systems adjusting and balancing. HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within the tolerances provided in the product specifications. Test and balance activities shall include air system and hydronic system balancing.

C408.2.2.1 Air systems balancing. Each supply air outlet and *zone* terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the *International Mechanical Code*. Discharge dampers used for air-system balancing are prohibited on constant-volume fans and variable volume fans with motors 10 hp (18.6 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp (0.746 kW), fan speed shall be adjusted to meet design flow conditions.

Exception: Fans with fan motors of 1 hp (0.74 kW) or less are not required to be provided with a means for air balancing.

C408.2.2.2 Hydronic systems balancing. Individual hydronic heating and cooling coils shall be equipped with means for balancing and measuring flow. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the capability to measure pressure across the pump, or test ports at each side of each pump.

Exception: The following equipment is not required to be equipped with a means for balancing or measuring flow:

1. Pumps with pump motors of 5 hp (3.7 kW) or less.
2. Where throttling results in not greater than 5 percent of the nameplate horsepower draw above that required if the impeller were trimmed.

C408.2.3 Functional performance testing. Functional performance testing specified in Sections C408.2.3.1 through C408.2.3.3 shall be conducted.

C408.2.3.1 Equipment. Equipment functional performance testing shall demonstrate the installation and operation of components, systems and system-to-system interfacing relationships in accordance with approved plans and specifications such that operation, function and maintenance serviceability for each of the commissioned systems are confirmed. Testing shall include all modes and *sequence of operation*, including under full-load, part-load and the following emergency conditions:

1. All modes as described in the *sequence* of *operation*.
2. Redundant or *automatic* back-up mode.
3. Performance of alarms.
4. Mode of operation upon a loss of power and restoration of power.

Exception: Unitary or packaged HVAC equipment listed in the tables in Section C403.3.2 that do not require supply air economizers.

C408.2.3.2 Controls. HVAC and service water-heating control systems shall be tested to document that control devices, components, equipment and systems are calibrated and adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with *approved* plans and specifications.

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C408.2.3.3 Economizers. Air economizers shall undergo a functional test to determine that they operate in accordance with manufacturer's specifications.

C408.2.4 Preliminary commissioning report. A preliminary report of *commissioning* test procedures and results shall be completed and certified by the *registered design professional* or *approved agency* and provided to the building owner or owner's authorized agent. The report shall be organized with mechanical and service hot water findings in separate sections to allow independent review. The report shall be identified as "Preliminary Commissioning Report," shall include the completed Commissioning Compliance Checklist, Figure C408.2.4, and shall identify:

1. Itemization of deficiencies found during testing required by this section that have not been corrected at the time of report preparation.
2. Deferred tests that cannot be performed at the time of report preparation because of climatic conditions.
3. Climatic conditions required for performance of the deferred tests.
4. Results of functional performance tests.
5. Functional performance test procedures used during the commissioning process, including measurable criteria for test acceptance.

C408.2.4.1 Acceptance of report. Buildings, or portions thereof, shall not be considered as acceptable for a final inspection pursuant to Section C105.2.6 until the *code official* has received the Preliminary Commissioning Report from the building owner or owner's authorized agent.

Project Information: _____ Project Name:_____

Project Address: _____

Commissioning Authority: _____

Commissioning Plan (Section C408.2.1)

☐ Commissioning Plan was used during construction and includes all items required by Section C408.2.1

☐ Systems Adjusting and Balancing has been completed.

☐ HVAC Equipment Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ HVAC Controls Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Economizer Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Lighting Controls Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Service Water Heating System Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Manual, record documents and training have been completed or scheduled

☐ Preliminary Commissioning Report submitted to owner and includes all items required by Section C408.2.4

I hereby certify that the commissioning provider has provided me with evidence of mechanical, service water heating and lighting systems commissioning in accordance with the 2021 IECC.

Signature of Building Owner or Owner's Representative _____ Date_____

FIGURE C408.2.4
COMMISSIONING COMPLIANCE CHECKLIST

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C408.2.4.2 Copy of report. The *code official* shall be permitted to require that a copy of the Preliminary Commissioning Report be made available for review by the *code official*.

C408.2.5 Documentation requirements. The *construction documents* shall specify that the documents described in this section be provided to the building owner or owner's authorized agent within 90 days of the date of receipt of the *certificate of occupancy*.

C408.2.5.1 System balancing report. A written report describing the activities and measurements completed in accordance with Section C408.2.2.

C408.2.5.2 Final commissioning report. A report of test procedures and results identified as "Final Commissioning Report" shall be delivered to the building owner or owner's authorized agent. The report shall be organized with mechanical system and service hot water system findings in separate sections to allow independent review. The report shall include the following:

1. Results of functional performance tests.
2. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.
3. Functional performance test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

Exception: Deferred tests that cannot be performed at the time of report preparation due to climatic conditions.

C408.3 Functional testing of lighting controls. Automatic lighting controls required by this code shall comply with this section.

C408.3.1 Functional testing. Prior to passing final inspection, the *registered design professional* or *approved agency* shall provide evidence that the lighting control systems have been tested to ensure that control hardware and software are calibrated, adjusted, programmed and in proper working condition in accordance with the *construction documents* and manufacturer's instructions. Functional testing shall be in accordance with Sections C408.3.1.1 through C408.3.1.3 for the applicable control type.

C408.3.1.1 Occupant sensor controls. Where *occupant sensor controls* are provided, the following procedures shall be performed:

1. Certify that the *occupant sensor* has been located and aimed in accordance with manufacturer recommendations.
2. For projects with seven or fewer *occupant sensors*, each sensor shall be tested.
3. For projects with more than seven *occupant sensors,* testing shall be done for each unique combination of sensor type and space geometry. Where multiples of each unique combination of sensor type and space geometry are provided, not less than 10 percent and in no case fewer than one, of each combination shall be tested unless the *code official* or design professional requires a higher percentage to be tested. Where 30 percent or more of the tested controls fail, all remaining identical combinations shall be tested.

   For *occupant sensor controls* to be tested, verify the following:

   3.1. Where *occupant sensor controls* include status indicators, verify correct operation.

   3.2. The controlled lights turn off or down to the permitted level within the required time.

   3.3. For auto-on *occupant sensor controls*, the lights turn on to the permitted level when an occupant enters the space.

   3.4. For manual-on *occupant sensor controls*, the lights turn on only when manually activated.

   3.5. The lights are not incorrectly turned on by movement in adjacent areas or by HVAC operation.

C408.3.1.2 Time-switch controls. Where *time-switch controls* are provided, the following procedures shall be performed:

1. Confirm that the *time-switch control* is programmed with accurate weekday, weekend and holiday schedules.
2. Provide documentation to the owner of *time-switch controls* programming including weekday, weekend, holiday schedules, and set-up and preference program settings.
3. Verify the correct time and date in the time switch.
4. Verify that any battery back-up is installed and energized.
5. Verify that the override time limit is set to not more than 2 hours.
6. Simulate occupied condition. Verify and document the following:

   6.1. All lights can be turned on and off by their respective area control switch.

   6.2. The switch only operates lighting in the enclosed space in which the switch is located.

7. Simulate unoccupied condition. Verify and document the following:

   7.1. Nonexempt lighting turns off.

   7.2. Manual override switch allows only the lights in the enclosed space where the override switch is located to turn on or

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remain on until the next scheduled shut-off occurs.

8. Additional testing as specified by the *registered design professional.*

C408.3.1.3 Daylight responsive controls. Where *daylight responsive controls* are provided, the following shall be verified:

1. Control devices have been properly located, field calibrated and set for accurate setpoints and threshold light levels.
2. Daylight controlled lighting loads adjust to light level setpoints in response to available daylight.
3. The calibration adjustment equipment is located for *ready access* only by authorized personnel.

C408.3.2 Documentation requirements. The *construction documents* shall specify that the documents described in this section be provided to the building owner or owner's authorized agent within 90 days of the date of receipt of the *certificate of occupancy*.

C408.3.2.1 Drawings. Construction documents shall include the location and catalogue number of each piece of equipment.

C408.3.2.2 Manuals. An operating and maintenance manual shall be provided and include the following:

1. Name and address of not less than one service agency for installed equipment.
2. A narrative of how each system is intended to operate, including recommended setpoints.
3. Submittal data indicating all selected options for each piece of lighting equipment and lighting controls.
4. Operation and maintenance manuals for each piece of lighting equipment. Required routine maintenance actions, cleaning and recommended relamping shall be clearly identified.
5. A schedule for inspecting and recalibrating all lighting controls.

C408.3.2.3 Report. A report of test results shall be provided and include the following:

1. Results of functional performance tests.
2. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.

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CHAPTER 5 [CE]
EXISTING BUILDINGS

User note:

About this chapter: *Many buildings are renovated or altered in numerous ways that could affect the energy use of the building as a whole. Chapter 5 requires the application of certain parts of Chapter 4 in order to maintain, if not improve, the conservation of energy by the renovated or altered building.*

SECTION C501
GENERAL

C501.1 Scope. The provisions of this chapter shall control the *alteration*, *repair*, *addition* and *change of occupancy* of existing buildings and structures.

C501.1.1 Existing buildings. Except as specified in this chapter, this code shall not be used to require the removal, *alteration* or abandonment of, nor prevent the continued use and maintenance of, an existing *building* or *building* system lawfully in existence at the time of adoption of this code.

** **C501.2 Compliance.** *Additions*, *alterations*, *repairs*, and changes of occupancy to, or relocation of, existing *buildings* and structures shall comply with Sections C502, C503, C504 and C505 of this code, as applicable, and with the provisions for *alterations*, *repairs*, *additions* and changes of occupancy or relocation, respectively, in the *International Building Code*, *International Existing Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Property Maintenance Code, International Private Sewage Disposal Code* and NFPA 70. Changes where unconditioned space is changed to conditioned space shall comply with Section C502.

Exception: *Additions*, *alterations*, *repairs* or changes of occupancy complying with ANSI/ASHRAE/IESNA 90.1.

C501.3 Maintenance. *Buildings* and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices and systems required by this code shall be maintained in conformance to the code edition under which they were installed. The owner or the owner's authorized agent shall be responsible for the maintenance of buildings and structures. The requirements of this chapter shall not provide the basis for removal or abrogation of energy conservation, fire protection and safety systems and devices in existing structures.

* **C501.4 New and replacement materials.** Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for *repairs*, provided that hazards to life, health or property are not created. Hazardous materials shall not be used where the code for new construction would not allow use of these materials in buildings of similar occupancy, purpose and location.

C501.5 Historic buildings. Provisions of this code relating to the construction, *repair, alteration*, restoration and movement of structures, and *change of occupancy* shall not be mandatory for *historic buildings* provided that a report has been submitted to the *code official* and signed by a *registered design professional*, or a representative of the State Historic Preservation Office or the historic preservation authority having jurisdiction, demonstrating that compliance with that provision would threaten, degrade or destroy the historic form, fabric or function of the *building*.

SECTION C502
ADDITIONS

C502.1 General. *Additions* to an existing *building*, *building* system or portion thereof shall conform to the provisions of this code as those provisions relate to new construction without requiring the unaltered portion of the existing *building* or *building* system to comply with this code. *Additions* shall not create an unsafe or hazardous condition or overload existing building systems. An *addition* shall be deemed to comply with this code if the *addition* alone complies or if the existing building and *addition* comply with this code as a single building.

C502.2 Change in space conditioning. Any nonconditioned or low-energy space that is altered to become *conditioned space* shall be required to comply with Section C502.

Exceptions:

1. Where the component performance alternative in Section C402.1.5 is used to comply with this section, the proposed UA shall be not greater than 110 percent of the target UA.
2. Where the total building performance option in Section C407 is used to comply with this section, the annual energy cost of the proposed design shall be not greater than 110 percent of the annual energy cost otherwise permitted by Section C407.2.

C502.3 Compliance. *Additions* shall comply with Sections C502.3.1 through C502.3.6.2.

C502.3.1 Vertical fenestration area. Additions shall comply with the following:

1. Where an addition has a new vertical fenestration area that results in a total building fenestration area less than or equal to that permitted by Section

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C402.4.1, the addition shall comply with Section C402.1.5, C402.4.3 or C407.

2. Where an addition with vertical fenestration that results in a total building fenestration area greater than Section C402.4.1 or an addition that exceeds the fenestration area greater than that permitted by Section C402.4.1, the fenestration shall comply with Section C402.4.1.1 for the addition only.
3. Where an addition has vertical fenestration that results in a total building vertical fenestration area exceeding that permitted by Section C402.4.1.1, the addition shall comply with Section C402.1.5 or C407.

C502.3.2 Skylight area. Skylights shall comply with the following:

1. Where an addition has new skylight area that results in a total building fenestration area less than or equal to that permitted by Section C402.4.1, the addition shall comply with Section C402.1.5 or C407.
2. Where an addition has new skylight area that results in a total building skylight area greater than permitted by Section C402.4.1 or where additions have skylight area greater than that permitted by Section C402.4.1, the skylight area shall comply with Section C402.4.1.2 for the addition only.
3. Where an addition has skylight area that results in a total building skylight area exceeding that permitted by Section C402.4.1.2, the addition shall comply with Section C402.1.5 or C407.

C502.3.3 Building mechanical systems. New mechanical systems and equipment that are part of the *addition* and serve the building heating, cooling and ventilation needs shall comply with Sections C403 and C408.

C502.3.4 Service water-heating systems. New service water-heating equipment, controls and service water-heating piping shall comply with Section C404.

C502.3.5 Pools and inground permanently installed spas. New pools and inground permanently installed spas shall comply with Section C404.9.

C502.3.6 Lighting power and systems. New lighting systems that are installed as part of the addition shall comply with Sections C405 and C408.

C502.3.6.1 Interior lighting power. The total interior lighting power for the *addition* shall comply with Section C405.3.2 for the *addition* alone, or the existing building and the *addition* shall comply as a single building.

C502.3.6.2 Exterior lighting power. The total exterior lighting power for the *addition* shall comply with Section C405.5.2 for the *addition* alone, or the existing building and the *addition* shall comply as a single building.

SECTION C503
ALTERATIONS

C503.1 General. *Alterations* to any *building* or structure shall comply with the requirements of Section C503. *Alterations* shall be such that the existing *building* or structure is not less conforming to the provisions of this code than the existing *building* or structure was prior to the *alteration*. *Alterations* to an existing *building*, *building* system or portion thereof shall conform to the provisions of this code as those provisions relate to new construction without requiring the unaltered portions of the existing *building* or *building* system to comply with this code. *Alterations* shall not create an unsafe or hazardous condition or overload existing *building* systems.

Exception: The following *alterations* need not comply with the requirements for new construction, provided that the energy use of the building is not increased:

1. Storm windows installed over existing *fenestration*.
2. Surface-applied window film installed on existing single-pane *fenestration* assemblies reducing solar heat gain, provided that the code does not require the glazing or *fenestration* to be replaced.
3. Existing ceiling, wall or floor cavities exposed during construction, provided that these cavities are filled with insulation.
4. Construction where the existing roof, wall or floor cavity is not exposed.
5. *Roof recover*.
6. *Air barriers* shall not be required for *roof recover* and roof replacement where the *alterations* or renovations to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.

C503.2 Building envelope. New building envelope assemblies that are part of the *alteration* shall comply with Sections C402.1 through C402.5.

Exception: Where the existing building exceeds the fenestration area limitations of Section C402.4.1 prior to alteration, the building is exempt from Section C402.4.1 provided that there is not an increase in fenestration area.

C503.2.1 Roof replacement. *Roof replacements* shall comply with Section C402.1.3, C402.1.4, C402.1.5 or C407 where the existing roof assembly is part of the *building thermal envelope* and contains insulation entirely above the roof deck. In no case shall the *R*-value of the roof insulation be reduced or the *U*-factor of the roof assembly be increased as part of the *roof replacement*.

C503.2.2 Vertical fenestration. The addition of *vertical fenestration* that results in a total building *fenestration* area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.1.5, C402.4.3 or C407. The addition of *vertical fenestration* that results in a total building *fenestration* area greater than Section C402.4.1 shall comply with Section C402.4.1.1 for the

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space adjacent to the new fenestration only. *Alterations* that result in a total building *vertical fenestration* area exceeding that specified in Section C402.4.1.1 shall comply with Section C402.1.5 or C407. Provided that the vertical fenestration area is not changed, using the same vertical fenestration area in the *standard reference design* as the building prior to alteration shall be an alternative to using the vertical fenestration area specified in Table C407.4.1(1).

** **C503.2.2.1 Application to replacement fenestration products.** Where some or all of an existing *fenestration* unit is replaced with a new *fenestration* product, including sash and glazing, the replacement *fenestration* unit shall meet the applicable requirements for *U*-factor and *SHGC* in Table C402.4.

Exception: An area-weighted average of the *U*-factor of replacement fenestration products being installed in the building for each fenestration product category listed in Table C402.4 shall be permitted to satisfy the *U*-factor requirements for each fenestration product category listed in Table C402.4. Individual fenestration products from different product categories listed in Table C402.4 shall not be combined in calculating the area-weighted average *U*-factor.

C503.2.3 Skylight area. New *skylight* area that results in a total building *skylight* area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.1.5, C402.4 or C407. The addition of *skylight* area that results in a total building skylight area greater than Section C402.4.1 shall comply with Section C402.4.1.2 for the space adjacent to the new skylights. *Alterations* that result in a total building skylight area exceeding that specified in Section C402.4.1.2 shall comply with Section C402.1.5 or C407. Provided that the skylight area is not changed, using the same skylight area in the *standard reference design* as the building prior to alteration shall be an alternative to using the skylight area specified in Table C407.4.1(1).

C503.3 Heating and cooling systems. New heating, cooling and duct systems that are part of the *alteration* shall comply with Sections C403 and C408.

C503.3.1 Economizers. New cooling systems that are part of *alteration* shall comply with Section C403.5.

C503.4 Service hot water systems. New service hot water systems that are part of the *alteration* shall comply with Sections C404 and C408.

C503.5 Lighting systems. New lighting systems that are part of the *alteration* shall comply with Sections C405 and C408.

Exception: *Alterations* that replace less than 10 percent of the luminaires in a space, provided that such *alterations* do not increase the installed interior lighting power.

SECTION C504
REPAIRS

C504.1 General. *Buildings* and structures, and parts thereof, shall be repaired in compliance with Section C501.3 and this section. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered to be part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section C501.3, ordinary *repairs* exempt from *permit* and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.

Where a building was constructed to comply with ANSI/ASHRAE/IESNA 90.1, repairs shall comply with the standard and need not comply with Sections C402, C403, C404 and C405.

C504.2 Application. For the purposes of this code, the following shall be considered to be repairs:

1. Glass-only replacements in an existing sash and frame.
2. *Roof repairs*.
3. Air barriers shall not be required for *roof repair* where the repairs to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.
4. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided that an existing vestibule that separates a conditioned space from the exterior shall not be removed.
5. *Repairs* where only the bulb, the ballast or both within the existing luminaires in a space are replaced, provided that the replacement does not increase the installed interior lighting power.

SECTION C505
CHANGE OF OCCUPANCY OR USE

C505.1 General. Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code. Where the use in a space changes from one use in Table C405.3.2(1) or C405.3.2(2) to another use in Table C405.3.2(1) or C405.3.2(2), the installed lighting wattage shall comply with Section C405.3. Where the space undergoing a change in occupancy or use is in a building with a fenestration area that exceeds the limitations of Section C402.4.1, the space is exempt from Section C402.4.1 provided that there is not an increase in fenestration area.

Exceptions:

1. Where the component performance alternative in Section C402.1.5 is used to comply with this section, the proposed UA shall not be greater than 110 percent of the target UA.

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2. Where the total building performance option in Section C407 is used to comply with this section, the annual energy cost of the proposed design shall not be greater than 110 percent of the annual energy cost otherwise permitted by Section C407.3.

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CHAPTER 6 [CE]
REFERENCED STANDARDS

User note:

About this chapter: *Chapter 6 lists the full title, edition year and address of the promulgator for all standards that are referenced in the code. The section numbers in which the standards are referenced are also listed.*

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section 108.

AAMA

American Architectural Manufacturers Association
1827 Walden Office Square
Suite 550
Schaumburg, IL 60173-4268

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors, and Skylights
Table C402.5.5

AHAM

Association of Home Appliance Manufacturers
1111 19th Street NW, Suite 402
Washington, DC 20036

ANSI/AHAM RAC-1—2015: Room Air Conditioners
Table C403.3.2(4)

AHRI

Air-Conditioning, Heating, & Refrigeration Institute
2111 Wilson Blvd, Suite 500
Arlington, VA22201

210/240—2017 and 2023: Performance Rating of Unitary Air-conditioning and Air-source Heat Pump Equipment
Table C403.3.2(1), Table C403.3.2(2)

310/380—2017 (CSA-C744-17): Packaged Terminal Air Conditioners and Heat Pumps
Table C403.3.2(4)

340/360—2019: Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment
Table C403.3.2(1), Table C403.3.2(2)

365(I-P)—2009: Commercial and Industrial Unitary Air-conditioning Condensing Units
Table C403.3.2(1)

390 (I-P)—2003: Performance Rating of Single Package Vertical Air-conditioners and Heat Pumps
Table C403.3.2(3)

400 (I-P)—2015: Performance Rating of Liquid to Liquid Heat Exchangers
C403.3.2

440—2008: Performance Rating of Room Fan Coils—with Addendum 1
C403.12.3

460—2005: Performance Rating of Remote Mechanical-draft Air-cooled Refrigerant Condensers
Table C403.3.2(7)

550/590 (I-P)—2018: Performance Rating of Water-chilling and Heat Pump Water-heating Packages Using the Vapor Compression Cycle
Table C403.3.2(3), Table C403.3.2(15)

560—2018: Absorption Water Chilling and Water Heating Packages
Table C403.3.2(3)

910—2014: Performance Rating of Indoor Pool Dehumidifiers
Table C403.3.2(11)

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AHRI—continued

920—2015: Performance Rating of DX-Dedicated Outdoor Air System Units
Table C403.3.2(12) , Table C403.3.2(13)

1160 (I-P) —2014: Performance Rating of Heat Pump Pool Heaters (with Addendum 1)
Table C404.2

1200 (I-P)—2013: Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets
Table C403.11.1

1230—2014: Performance Rating of Variable Refrigerant Flow (VRF) Multi-split Air-Conditioning and Heat Pump Equipment (with Addendum 1)
Table C403.3.2(9)

1250 (I-P)—2014: Standard for Performance Rating in Walk-in Coolers and Freezers
Table C403.11.2.1(3)

1360—2017: Performance Rating of Computer and Data Processing Room Air Conditioners
Table C403.3.2(10) , Table C403.3.2(16)

ISO/AHRI/ASHRAE 13256-1 (2012): Water-to-Air and Brine-to-Air Heat Pumps—Testing and Rating for Performance
Table C403.3.2(14)

AMCA

Air Movement and Control Association International
30 West University Drive
Arlington Heights, IL 60004-1806

208—18: Calculation of the Fan Energy Index
C403.8.3

220—19: Laboratory Methods of Testing Air Curtain Units for Aerodynamic Performance Rating
C402.5.9

230—15: Laboratory Methods of Testing Air Circulating Fans for Rating and Certification
C403.9

500D—18: Laboratory Methods for Testing Dampers for Rating
C403.7.7

ANSI

American National Standards Institute
25 West 43rd Street, 4th Floor
New York, NY 10036

Z21.10.3/CSA 4.3—17: Gas Water Heaters, Volume III—Storage Water Heaters with Input Ratings Above 75,000 Btu per Hour, Circulating Tank and Instantaneous
Table C404.2

ANSI Z21.47—2016/CSA 2.3—2016: Gas-Fired Central Furnaces
Table C403.3.2(4)

ANSI Z83.8—2016/CSA 2.6—2016: Gas Unit Heater, Gas Packaged Heaters, Gas Utility Heaters And Gas-Fired Duct Furnaces
Table C403.3.2(4)

APSP

Pool & Hot Tub Alliance (formerly the Association of Pool and Spa Professionals
2111 Eisenhower Avenue, Suite 580
Alexandria, VA 22314

14—2019: American National Standard for Portable Electric Spa Energy Efficiency
C404.7

ASABE

American Society of Agricultural and Biological Engineers
2950 Niles Road
St. Joseph, MI 49085

S640—2017: Quantities and Units of Electromagnetic Radiation for Plants (Photosynthetic Organisms)
C405.4

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ASHRAE

ASHRAE
180 Technology Parkway NW
Peachtree Corners, GA 30092

55—2017: Thermal Environmental Conditions for Human Occupancy
Table C407.4.1(1)

90.1—2019: Energy Standard for Buildings Except Low-rise Residential Buildings
C402.1.4, C406.2

90.4—2016: Energy Standard for Data Centers
C403.1.2 , C405.2.4

140—2014: Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs
C407.5.1

146—2011: Testing for Rating Pool Heaters
Table C404.2

ANSI/ASHRAE/ACCA Standard 183—(RA2017): Peak Cooling and Heating Load Calculations in Buildings, Except Low-rise Residential Buildings
C403.1.1

ASHRAE—2020: HVAC Systems and Equipment Handbook—2020
C403.1.1

ISO/AHRI/ASHRAE 13256-1 (2012): Water-to-Air and Brine-to-Air Heat Pumps—Testing and Rating for Performance
Table C403.3.2(14)

ISO/AHRI/ASHRAE 13256-2 (2012): Water-to-Water and Brine-to-Water Heat Pumps—Testing and Rating for Performance
Table C403.3.2(14)

ASME

American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990

ASME A17.1—2019/CSA B44—19: Safety Code for Elevators and Escalators
C405.9.2

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

C90—2016A: Specification for Load-bearing Concrete Masonry Units
Table C402.1.3

C1363—11: Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
C303.1.4.1, Table C402.1.4, 402.2.7

C1371—15: Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers
Table C402.3

C1549—2016: Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer
Table C402.3

D1003—13: Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics
C402.4.2.2

D8052/D8052M—2017: Standard Test Method for Quantification of Air Leakage in Low-Sloped Membrane Roof Assemblies
C402.5.2.1.2

E283—2004(2012): Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen
C402.5.1.4, Table C402.5.4, C402.5.10

E408—13: Test Methods for Total Normal Emittance of Surfaces Using Inspection-meter Techniques
Table C402.3

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ASTM—continued

E779—10(2018): Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
C402.5.3, C402.5.4, C406.9

E903—2012: Standard Test Method Solar Absorptance, Reflectance and Transmittance of Materials Using Integrating Spheres (Withdrawn 2005)
Table C402.3

E1677—11: Specification for Air Barrier (AB) Material or Systems for Low-rise Framed Building Walls
C402.5.2.1.2

E1827—2011(2017): Standard Test Methods for Determining Airtightness of Building Using an Orifice Blower Door
C402.5.3, C402.5.4, C406.9

E1918—06(2016): Standard Test Method for Measuring Solar Reflectance of Horizontal or Low-sloped Surfaces in the Field
Table C402.3

E1980—11: Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-sloped Opaque Surfaces
Table C402.3

E2178—13: Standard Test Method for Air Permanence of Building Materials
C402.5.2.1.1

E2357—2018: Standard Test Method for Determining Air Leakage of Air Barriers Assemblies
C402.5.2.1.2

F1281—2017: Specification for Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL_PEX) Pressure Pipe
Table C404.5.2.1

F1361—2017: Standard Test Method for Performance of Open Deep Fat Fryers
Table C406.12(1)

F1484—2018: Standard Test Method for Performance of Steam Cookers
Table C406.12(2)

F1495—2014a: Standard Specification for Combination Oven Electric or Gas Fired
Table C406.12(4)

F1496—2013: Standard Test Method for Performance of Convection Ovens
Table C406.12(4)

F1696—2018: Standard Test Method for Energy Performance of Stationary-Rack, Door-Type Commercial Dishwashing Machines
Table C406.12(3)

F1920—2015: Standard Test Method for Performance of Rack Conveyor Commercial Dishwashing Machines
Table C406.12(3)

F2093—2018: Standard Test Method for Performance of Rack Ovens
Table C406.12(4)

F2144—2017: Standard Test Method for Performance of Large Open Vat Fryers
Table C406.12(1)

F2861—2017: Standard Test Method for Enhanced Performance of Combination Oven in Various Modes
Table C406.12(4)

CRRC

Cool Roof Rating Council
2435 North Lombard Street
Portland, OR 97217

ANSI/CRRC S100—2020: Standard Test Methods for Determining Radiative Properties of Materials
Table C402.3, C402.3.1

CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland, OH 44131-5516

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors and Unit Skylights
Table C402.5.5

CSA B55.1—2015: Test Method for Measuring Efficiency and Pressure Loss of Drain Water Heat Recovery Units
C404.7

CSA B55.2—2015: Drain Water Heat Recovery Units
C404.7

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CTI

Cooling Technology Institute
P. O. Box 681807
Houston, TX 77268

ATC-105—2019: Acceptance Test Code for Water Cooling Towers
Table C403.3.2(7)

ATC-105DS—2018: Acceptance Test Code for Dry Fluid Coolers
Table C403.3.2(7)

ATC-105S—11: Acceptance Test Code for Closed Circuit Cooling Towers
Table C403.3.2(7), Table C403.3.2(8)

ATC-106—11: Acceptance Test for Mechanical Draft Evaporative Vapor Condensers
Table C403.3.2(7), Table C403.3.2(8)

CTI STD-201 RS(17): Performance Rating of Evaporative Heat Rejection Equipment
Table C403.3.2(7), Table C403.3.2(8)

DASMA

Door & Access Systems Manufacturers Association, International
1300 Sumner Avenue
Cleveland, OH 44115-2851

105—2017: Test Method for Thermal Transmittance and Air Infiltration of Garage Doors and Rolling Doors
C303.1.3, Table C402.5.5

DOE

US Department of Energy
c/o Superintendent of Documents
1000 Independence Avenue SW
Washington, DC 20585

10 CFR, Part 430—2015: Energy Conservation Program for Consumer Products: Test Procedures and Certification and Enforcement Requirement for Plumbing Products; and Certification and Enforcement Requirements for Residential Appliances; Final Rule
Table C403.3.2(1), Table C403.3.2(2), Table C403.3.2(5), Table C403.3.2(6), Table C403.3.2(14), Table C404.2

10 CFR, Part 431—2015: Energy Efficiency Program for Certain Commercial and Industrial Equipment: Test Procedures and Efficiency Standards; Final Rules
Table C403.3.2(6), C403.8.4, C403.11, C403.11.1, Table C403.11.1, C403.11.2, C405.7, Table C405.7, C405.8, Table C405.8(1), Table C405.8(2), Table C405.8(3), Table C405.8(4)

ICC

International Code Council, Inc.
500 New Jersey Avenue NW 6th Floor
Washington, DC 20001

IBC—21: International Building Code®
C201.3, C303.2, C402.5.6, C501.2

ICC 500—2020: Standard for the Design and Construction of Storm Shelters
C402.4.2

IFC—21: International Fire Code®
C201.3, C501.2

IFGC—21: International Fuel Gas Code®
C201.3, C501.2

IMC—21: International Mechanical Code®
C403.2.2, C403.6, C403.6.6, C403.7.1, C403.7.2, C403.7.4.2, C403.7.5, C403.7.7, C403.12.1, C403.12.2.1, C403.12.2.2, C406.6, C501.2

IPC—21: International Plumbing Code®
C201.3, C501.2

IPMC—21: International Property Maintenance Code®
C501.2

IPSDC—21: International Private Sewage Disposal Code®
C501.2

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IEEE

Institute of Electrical and Electronic Engineers
3 Park Avenue, 17th Floor
New York, NY 10016

IEEE 515.1—2012: IEEE Standard for the Testing, Design, Installation, and Maintenance of Electrical Resistance Trace Heating for Commercial Applications
C404.6.2

IES

Illuminating Engineering Society
120 Wall Street, 17th Floor
New York, NY 10005-4001

ANSI/ASHRAE/IES 90.1—2019: Energy Standard for Buildings, Except Low-rise Residential Buildings
C401.2, Table C402.1.3, Table C402.1.4, C406.2, C502.1, C503.1, C504.1

ISO

International Organization for Standardization
Chemin de Blandonnet 8, CP 401, 1214 Vernier
Geneva, Switzerland

ISO/AHRI/ASHRAE 13256-1(: 2017): Water-to-Air and Brine-to-Air Heat Pumps—Testing and Rating for Performance
Table C403.3.2(14)

ISO/AHRI/ASHRAE 13256-2(2017): Water-to-Water and Brine-to-Water Heat Pumps—Testing and Rating for Performance
Table C403.3.2(14)

NEMA

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, VA 22209

MG1—2016: Motors and Generators
C202

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

70—20: National Electrical Code
C501.2

NFRC

National Fenestration Rating Council, Inc.
6305 Ivy Lane, Suite 140
Greenbelt, MD 20770

100—2020: Procedure for Determining Fenestration Products *U*-factors
C303.1.3, Table 402.1.4, C402.2.1.5, C402.4.1.1

200—2020: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
C303.1.3, C402.4.1.1

203—2017: Procedure for Determining Visible Transmittance of Tubular Daylighting Devices
C303.1.3

400—2020: Procedure for Determining Fenestration Product Air Leakage
Table C402.5.5

SMACNA

Sheet Metal and Air Conditioning Contractors' National Association, Inc.
4021 Lafayette Center Drive
Chantilly, VA 20151-1219

ANSI/SMACNA 016—2012: HVAC Air Duct Leakage Test Manual Second Edition
C403.12.2.3

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UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062-2096

710—12: Exhaust Hoods for Commercial Cooking Equipment—with Revisions through November 2013
C403.7.5

727—18: Oil-fired Central Furnaces
Table C403.3.2(4), Table C403.3.2(5)

731—18: Oil-fired Unit Heaters
Table C403.3.2(5)

1784—15: Air Leakage Tests of Door Assemblies—with Revisions through February 2015
C402.5.6, C402.5.7

US-FTC

United States-Federal Trade Commission
600 Pennsylvania Avenue NW
Washington, DC 20580

CFR Title 16 (2015): *R*-value Rule
C303.1.4

WDMA

Window and Door Manufacturers Association
2025 M Street NW, Suite 800
Washington, DC 20036-3309

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors and Skylights
Table C402.5.5

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APPENDIX CA
BOARD OF APPEALS—COMMERCIAL

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User note:

About this appendix: *Appendix CA provides criteria for Board of Appeals members. Also provided are procedures by which the Board of Appeals should conduct its business.*

SECTION CA101
GENERAL

CA101.1 Scope. A board of appeals shall be established within the jurisdiction for the purpose of hearing applications for modification of the requirements of this code pursuant to the provisions of Section C110. The board shall be established and operated in accordance with this section, and shall be authorized to hear evidence from appellants and the code official pertaining to the application and intent of this code for the purpose of issuing orders pursuant to these provisions.

CA101.2 Application for appeal. Any person shall have the right to appeal a decision of the code official to the board. An application for appeal shall be based on a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.

CA101.2.1 Limitation of authority. The board shall not have authority to waive requirements of this code or interpret the administration of this code.

CA101.2.2 Stays of enforcement. Appeals of notice and orders, other than Imminent Danger notices, shall stay the enforcement of the notice and order until the appeal is heard by the board.

CA101.3 Membership of board. The board shall consist of five voting members appointed by the chief appointing authority of the jurisdiction. Each member shall serve for **[INSERT NUMBER OF YEARS]** years or until a successor has been appointed. The board member's terms shall be staggered at intervals, so as to provide continuity. The code official shall be an ex officio member of said board but shall not vote on any matter before the board.

CA101.3.1 Qualifications. The board shall consist of five individuals, who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.

CA101.3.2 Alternate members. The chief appointing authority is authorized to appoint two alternate members who shall be called by the board chairperson to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership, and shall be appointed for the same term or until a successor has been appointed.

CA101.3.3 Vacancies. Vacancies shall be filled for an unexpired term in the same manner in which original appointments are required to be made.

CA101.3.4 Chairperson. The board shall annually select one of its members to serve as chairperson.

CA101.3.5 Secretary. The chief appointing authority shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings which shall set forth the reasons for the board's decision, the vote of each member, the absence of a member and any failure of a member to vote.

CA101.3.6 Conflict of interest. A member with any personal, professional or financial interest in a matter before the board shall declare such interest and refrain from participating in discussions, deliberations and voting on such matters.

CA101.3.7 Compensation of members. Compensation of members shall be determined by law.

CA101.3.8 Removal from the board. A member shall be removed from the board prior to the end of their terms only for cause. Any member with continued absence from regular meeting of the board may be removed at the discretion of the chief appointing authority.

CA101.4 Rules and procedures. The board shall establish policies and procedures necessary to carry out its duties consistent with the provisions of this code and applicable state law. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be presented.

CA101.5 Notice of meeting. The board shall meet upon notice from the chairperson, within 10 days of the filing of an appeal or at stated periodic intervals.

CA101.5.1 Open hearing. All hearings before the board shall be open to the public. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

CA101.5.2 Quorum. Three members of the board shall constitute a quorum.

CA101.5.3 Postponed hearing. When five members are not present to hear an appeal, either the appellant or the

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appellant's representative shall have the right to request a postponement of the hearing.

CA101.6 Legal counsel. The jurisdiction shall furnish legal counsel to the board to provide members with general legal advice concerning matters before them for consideration. Members shall be represented by legal counsel at the jurisdiction's expense in all matters arising from service within the scope of their duties.

CA101.7 Board decision. The board shall only modify or reverse the decision of the code official by a concurring vote of three or more members.

CA101.7.1 Resolution. The decision of the board shall be by resolution. Every decision shall be promptly filed in writing in the office of the code official within three days and shall be open to the public for inspection. A certified copy shall be furnished to the appellant or the appellant's representative and to the code official.

CA101.7.2 Administration. The code official shall take immediate action in accordance with the decision of the board.

CA101.8 Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

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APPENDIX CB
SOLAR-READY ZONE—COMMERCIAL

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User note:

About this appendix: *Appendix CB is intended to encourage the installation of renewable energy systems by preparing buildings for the future installation of solar energy equipment, piping and wiring.*

SECTION CB101
SCOPE

CB101.1 General. These provisions shall be applicable for new construction where solar-ready provisions are required.

SECTION CB102
GENERAL DEFINITION

SOLAR-READY ZONE. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

SECTION CB103
SOLAR-READY ZONE

CB103.1 General. A solar-ready zone shall be located on the roof of buildings that are five stories or less in height above grade plane, and are oriented between 110 degrees and 270 degrees of true north or have low-slope roofs. Solar-ready zones shall comply with Sections CB103.2 through CB103.9.

Exceptions:

1. A building with a permanently installed, on-site renewable energy system.
2. A building with a solar-ready zone that is shaded for more than 70 percent of daylight hours annually.
3. A building where the licensed design professional certifies that the incident solar radiation available to the building is not suitable for a solar-ready zone.
4. A building where the licensed design professional certifies that the solar zone area required by Section CB103.3 cannot be met because of extensive rooftop equipment, skylights, vegetative roof areas or other obstructions.

CB103.2 Construction document requirements for a solar-ready zone. Construction documents shall indicate the solar-ready zone.

CB103.3 Solar-ready zone area. The total solar-ready zone area shall be not less than 40 percent of the roof area calculated as the horizontally projected gross roof area less the area covered by skylights, occupied roof decks, vegetative roof areas and mandatory *access* or set back areas as required by the *International Fire Code*. The solar-ready zone shall be a single area or smaller, separated sub-zone areas. Each sub-zone shall be not less than 5 feet (1524 mm) in width in the narrowest dimension.

CB103.4 Obstructions. Solar ready zones shall be free from obstructions, including pipes, vents, ducts, HVAC equipment, skylights and roof-mounted equipment.

CB103.5 Roof loads and documentation. A collateral dead load of not less than 5 pounds per square foot (5 psf) (24.41 kg/m^2) shall be included in the gravity and lateral design calculations for the solar-ready zone. The structural design loads for roof dead load and roof live load shall be indicated on the construction documents.

CB103.6 Interconnection pathway. Construction documents shall indicate pathways for routing of conduit or piping from the solar-ready zone to the electrical service panel and electrical energy storage system area or service hot water system.

CB103.7 Electrical energy storage system-ready area. The floor area of the electrical energy storage system-ready area shall be not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension, and located in accordance with Section 1207 of the *International Fire Code*. The location and layout diagram of the electrical energy storage system-ready area shall be indicated on the construction documents.

CB103.8 Electrical service reserved space. The main electrical service panel shall have a reserved space to allow installation of a dual-pole circuit breaker for future solar electric and a dual-pole circuit breaker for future electrical energy storage system installation. These spaces shall be labeled "For Future Solar Electric and Storage." The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

CB103.9 Construction documentation certificate. A permanent certificate, indicating the solar-ready zone and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

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APPENDIX CC
ZERO ENERGY COMMERCIAL BUILDING PROVISIONS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User note:

About this chapter: *Appendix CC provides a model for applying new renewable energy generation when new buildings add electric load to the grid. This renewable energy will avoid the additional emissions that would otherwise occur from conventional power generation.*

SECTION CC101
GENERAL

CC101.1 Purpose. The purpose of this appendix is to supplement the *International Energy Conservation Code* and require renewable energy systems of adequate capacity to achieve net zero carbon.

CC101.2 Scope. This appendix applies to new buildings that are addressed by the *International Energy Conservation Code*.

Exceptions:

1. Detached one- and two-family dwellings and townhouses as well as Group R-2 buildings three stories or less in height above grade plane, manufactured homes (mobile dwellings), and manufactured houses (modular dwellings).
2. Buildings that use neither electricity nor fossil fuel.

SECTION CC102
DEFINITIONS

CC102.1 Definitions. The definitions contained in this section supplement or modify the definitions in the *International Energy Conservation Code*.

ADJUSTED OFF-SITE RENEWABLE ENERGY. The amount of energy production from off-site renewable energy systems that may be used to offset building energy.

BUILDING ENERGY. All energy consumed at the *building site* as measured at the site boundary. Contributions from on-site or off-site renewable energy systems shall not be considered when determining the building energy.

ENERGY UTILIZATION INTENSITY (EUI). The site energy for either the baseline building or the proposed building divided by the gross *conditioned floor area* plus any semiheated floor area of the building. For the baseline building, the EUI can be divided between regulated energy use and unregulated energy use.

OFF-SITE RENEWABLE ENERGY SYSTEM. Renewable energy system not located on the building project.

ON-SITE RENEWABLE ENERGY SYSTEM. Renewable energy systems on the building project.

RENEWABLE ENERGY SYSTEM. Photovoltaic, solar thermal, geothermal energy and wind systems used to generate energy.

SEMIHEATED SPACE. An enclosed space within a building that is heated by a heating system whose output capacity is greater than or equal to 3.4 Btu/h × ft^2 of floor area but is not a conditioned space.

ZERO ENERGY PERFORMANCE INDEX (ZEPI PB/EE). The ratio of the proposed building EUI without renewables to the baseline building EUI, expressed as a percentage.

SECTION CC103
MINIMUM RENEWABLE ENERGY

CC103.1 Renewable energy. On-site renewable energy systems shall be installed, or off-site renewable energy shall be procured to offset the building energy as calculated in Equation CC-1.

$$RE_{onsite} + RE_{offsite} \geq E_{building} \qquad \textbf{(Equation CC-1)}$$

where:

RE_{onsite} = Annual site energy production from on-site renewable energy systems (see Section CC103.2).

$RE_{offsite}$ = Adjusted annual site energy production from off-site renewable energy systems that may be credited against building energy use (see Section CC103.3).

$E_{building}$ = Building energy use without consideration of renewable energy systems.

When Section C401.2.1(1) is used for compliance with the *International Energy Conservation Code*, building energy shall be determined by multiplying the gross *conditioned floor area* plus the gross semiheated floor area of the proposed building by an EUI selected from Table CC103.1. Use a weighted average for mixed-use buildings.

When Section C401.2.1, Item 2 or Section C401.2.2 is used for compliance with the *International Energy Conservation Code*, building energy shall be determined from energy simulations.

CC103.2 Calculation of on-site renewable energy. The annual energy production from on-site renewable energy

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TABLE CC103.1
ENERGY UTILIZATION INTENSITY FOR BUILDING TYPES AND CLIMATES (kBtu/ft² – yr)

BUILDING AREA TYPE	CLIMATE ZONE																
	0A/1A	0B/1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
	kBtu/ft² – yr																
Healthcare/hospital (I-2)	119	120	119	113	116	109	106	116	109	106	118	110	105	126	116	131	142
Hotel/motel (R-1)	73	76	73	68	70	67	65	69	66	65	71	68	65	77	72	81	89
Multiple-family (R-2)	43	45	41	41	43	42	36	45	43	41	47	46	41	53	48	53	59
Office (B)	31	32	30	29	29	28	25	28	27	25	29	28	25	33	30	32	36
Restaurant (A-2)	389	426	411	408	444	420	395	483	437	457	531	484	484	589	538	644	750
Retail (M)	46	50	45	46	44	44	37	48	44	44	52	50	46	60	52	64	77
School (E)	42	46	42	40	40	39	36	39	40	40	39	43	37	44	40	45	54
Warehouse (S)	9	12	9	11	12	11	10	17	13	14	23	17	15	32	23	32	32
All others	55	58	54	53	53	51	48	54	52	51	57	54	50	63	57	65	73

systems shall be determined using the PVWatts software or other software approved by the code official.

CC103.3 Off-site renewable energy. Off-site energy shall comply with Sections CC103.3.1 and CC103.3.2.

CC103.3.1 Qualifying off-site procurement methods. The following are considered qualifying off-site renewable energy procurement methods:

1. Community renewables: an off-site renewable energy system for which the owner has purchased or leased renewable energy capacity along with other subscribers.
2. Renewable energy investment fund: an entity that installs renewable energy capacity on behalf of the owner.
3. Virtual power purchase agreement: a power purchase agreement for off-site renewable energy where the owner agrees to purchase renewable energy output at a fixed price schedule.
4. Direct ownership: an off-site renewable energy system owned by the building project owner.
5. Direct access to wholesale market: an agreement between the owner and a renewable energy developer to purchase renewable energy.
6. Green retail tariffs: a program by the retail electricity provider to provide 100-percent renewable energy to the owner.
7. Unbundled Renewable Energy Certificates (RECs): certificates purchased by the owner representing the environmental benefits of renewable energy generation that are sold separately from the electric power.

CC103.3.2 Requirements for all procurement methods. The following requirements shall apply to all *off-site renewable* energy procurement methods:

1. The building owner shall sign a legally binding contract to procure qualifying off-site renewable energy.
2. The procurement contract shall have duration of not less than 15 years and shall be structured to survive a partial or full transfer of ownership of the property.
3. RECs and other environmental attributes associated with the procured *off-site renewable energy* shall be assigned to the building project for the duration of the contract.
4. The renewable energy generating source shall include one or more of the following: photovoltaic systems, solar thermal power plants, geothermal power plants and wind turbines.
5. The generation source shall be located where the energy can be delivered to the building site by the same utility or distribution entity, the same independent system operator (ISO) or regional transmission organization (RTO), or within integrated ISOs (electric coordination council).
6. The *off-site renewable energy* producer shall maintain transparent accounting that clearly assigns production to the building. Records on power sent to or purchased by the building shall be retained by the building owner and made available for inspection by the code official upon request.

CC103.3.3 Adjusted off-site renewable energy. The process for calculating the adjusted *off-site renewable energy* is shown in Equation CC-2.

$$RE_{offsite} = \sum_{i=1}^{n} PF_i \times RE_i = PF_1 \times RE_1 + PF_2 \times RE_2 + \ldots + PF_n \times RE_n$$

(Equation CC-2)

where:

$RE_{offsite}$ = Adjusted off-site renewable energy.

PF_i = Procurement factor for the i^{th} renewable energy procurement method or class taken from Table CC103.3.3.

RE_i = Annual energy production for the i^{th} renewable energy procurement method or class.

n = The number of renewable energy procurement options or classes considered.

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TABLE CC103.3.3
DEFAULT OFF-SITE RENEWABLE ENERGY PROCUREMENT METHODS, CLASSES AND COEFFICIENTS

CLASS	PROCUREMENT FACTOR (PF)	PROCUREMENT OPTIONS	ADDITIONAL REQUIREMENTS (see also Section CC103.3.2)
1	0.75	Community solar	—
		REIFs	Entity must be managed to prevent fraud or misuse of funds.
		Virtual PPA	—
		Self-owned off-site	Provisions shall prevent the generation from being sold separately from the building.
2	0.55	Green retail tariffs	The offering shall not include the purchase of unbundled RECs.
		Direct access	The offering shall not include the purchase of unbundled RECs.
3	0.20	Unbundled RECs	The vintage of the RECs shall align with building energy use.

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CHAPTER 1 [RE]
SCOPE AND ADMINISTRATION

User note:

About this chapter: *Chapter 1 establishes the limits of applicability of this code and describes how the code is to be applied and enforced. Chapter 1 is in two parts: Part 1—Scope and Application (Sections R101–R102) and Part 2—Administration and Enforcement (Sections R103–R110). Section R101 identifies which buildings and structures come under its purview and references other I-Codes as applicable. Standards and codes are scoped to the extent referenced (see Section R108.1).*

This code is intended to be adopted as a legally enforceable document, and it cannot be effective without adequate provisions for its administration and enforcement. The provisions of Chapter 1 establish the authority and duties of the code official appointed by the authority having jurisdiction and also establish the rights and privileges of the design professional, contractor and property owner.

PART 1—SCOPE AND APPLICATION

SECTION R101
SCOPE AND GENERAL REQUIREMENTS

R101.1 Title. This code shall be known as the *Energy Conservation Code* of **the City of Pueblo, Colorado** and shall be cited as such. It is referred to herein as "this code."

R101.2 Scope. This code applies to *residential buildings, building* sites and associated systems and equipment.

R101.3 Intent. This code shall regulate the design and construction of *buildings* for the effective use and conservation of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

R101.4 Applicability. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

R101.4.1 Mixed residential and commercial buildings. Where a *building* includes both *residential building* and *commercial building* portions, each portion shall be separately considered and meet the applicable provisions of the IECC—Commercial Provisions or IECC—Residential Provisions.

R101.5 Compliance. *Residential buildings* shall meet the provisions of IECC—Residential Provisions. *Commercial buildings* shall meet the provisions of IECC—Commercial Provisions.

R101.5.1 Compliance materials. The *code official* shall be permitted to approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code.

SECTION R102
ALTERNATIVE MATERIALS, DESIGN AND METHODS OF CONSTRUCTION AND EQUIPMENT

R102.1 General. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. The *code official* shall have the authority to approve an alternative material, design or method of construction upon the written application of the owner or the owner's authorized agent. The code official shall first find that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code for strength, effectiveness, fire resistance, durability, energy conservation and safety. The *code official* shall respond to the applicant, in writing, stating the reasons why the alternative was *approved* or was not *approved*.

R102.1.1 Above code programs. The *code official* or other authority having jurisdiction shall be permitted to deem a national, state or local energy-efficiency program to exceed the energy efficiency required by this code. *Buildings approved* in writing by such an energy-efficiency program shall be considered to be in compliance with this code where such buildings also meet the requirements identified in Table R405.2 and the *building thermal envelope* is greater than or equal to levels of efficiency and solar heat gain coefficients (SHGC) in Tables 402.1.1 and 402.1.3 of the 2009 *International Energy Conservation Code*.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION R103
CONSTRUCTION DOCUMENTS

R103.1 General. Construction documents, technical reports and other supporting data shall be submitted in one or more sets, or in a digital format where allowed by the *code official*, with each application for a permit. The construction documents and technical reports shall be prepared by a registered design professional where required by the statutes of the

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jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

Exception: The *code official* is authorized to waive the requirements for construction documents or other supporting data if the *code official* determines they are not necessary to confirm compliance with this code.

R103.2 Information on construction documents. Construction documents shall be drawn to scale on suitable material. Electronic media documents are permitted to be submitted where *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the *building*, systems and equipment as herein governed. Details shall include the following as applicable:

1. Energy compliance path.
2. Insulation materials and their *R*-values.
3. Fenestration *U*-factors and *solar heat gain coefficients* (SHGC).
4. Area-weighted *U*-factor and *solar heat gain coefficients* (SHGC) calculations.
5. Mechanical system design criteria.
6. Mechanical and service water-heating systems and equipment types, sizes and efficiencies.
7. Equipment and system controls.
8. Duct sealing, duct and pipe insulation and location.
9. Air sealing details.

R103.2.1 Building thermal envelope depiction. The *building thermal envelope* shall be represented on the construction documents.

R103.3 Examination of documents. The *code official* shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances. The *code official* is authorized to utilize a registered design professional, or other *approved* entity not affiliated with the building design or construction, in conducting the review of the plans and specifications for compliance with the code.

R103.3.1 Approval of construction documents. When the *code official* issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped "Reviewed for Code Compliance." Such *approved* construction documents shall not be changed, modified or altered without authorization from the *code official*. Work shall be done in accordance with the *approved* construction documents.

One set of construction documents so reviewed shall be retained by the *code official*. The other set shall be returned to the applicant, kept at the site of work and shall be open to inspection by the *code official* or a duly authorized representative.

R103.3.2 Previous approvals. This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

R103.3.3 Phased approval. The *code official* shall have the authority to issue a permit for the construction of part of an energy conservation system before the construction documents for the entire system have been submitted or *approved*, provided adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holders of such permit shall proceed at their own risk without assurance that the permit for the entire energy conservation system will be granted.

R103.4 Amended construction documents. Work shall be installed in accordance with the *approved* construction documents, and any changes made during construction that are not in compliance with the *approved* construction documents shall be resubmitted for approval as an amended set of construction documents.

R103.5 Retention of construction documents. One set of *approved* construction documents shall be retained by the *code official* for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

SECTION R104
FEES

R104.1 Fees. A permit shall not be issued until the fees prescribed in Section R104.2 have been paid, nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

R104.2 Schedule of permit fees. Where a permit is required, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

R104.3 Work commencing before permit issuance. Any person who commences any work before obtaining the necessary permits shall be subject to an additional fee established by the *code official* that shall be in addition to the required permit fees.

R104.4 Related fees. The payment of the fee for the construction, *alteration*, removal or demolition of work done in connection to or concurrently with the work or activity authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

R104.5 Refunds. The *code official* is authorized to establish a refund policy.

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SECTION R105
INSPECTIONS

R105.1 General. Construction or work for which a permit is required shall be subject to inspection by the *code official* or his or her designated agent, and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved*. It shall be the duty of the permit applicant to cause the work to remain visible and able to be accessed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material, product, system or building component required to allow inspection to validate compliance with this code.

R105.2 Required inspections. The *code official* or his or her designated agent, upon notification, shall make the inspections set forth in Sections R105.2.1 through R105.2.5.

R105.2.1 Footing and foundation inspection. Inspections associated with footings and foundations shall verify compliance with the code as to *R*-value, location, thickness, depth of burial and protection of insulation as required by the code and *approved* plans and specifications.

R105.2.2 Framing and rough-in inspection. Inspections at framing and rough-in shall be made before application of interior finish and shall verify compliance with the code as to: types of insulation and corresponding *R*-values and their correct location and proper installation; fenestration properties such as *U*-factor and SHGC and proper installation; air leakage controls as required by the code; and *approved* plans and specifications.

R105.2.3 Plumbing rough-in inspection. Inspections at plumbing rough-in shall verify compliance as required by the code and *approved* plans and specifications as to types of insulation and corresponding *R*-values and protection, and required controls.

R105.2.4 Mechanical rough-in inspection. Inspections at mechanical rough-in shall verify compliance as required by the code and *approved* plans and specifications as to installed HVAC equipment type and size, required controls, system insulation and corresponding *R*-value, system air leakage control, programmable thermostats, dampers, whole-house ventilation, and minimum fan efficiency.

Exception: Systems serving multiple dwelling units shall be inspected in accordance with Section C105.2.4.

R105.2.5 Final inspection. The *building* shall have a final inspection and shall not be occupied until *approved*. The final inspection shall include verification of the installation of all required *building* systems, equipment and controls and their proper operation and the required number of high-efficacy lamps and fixtures.

R105.3 Reinspection. A *building* shall be reinspected where determined necessary by the *code official*.

R105.4 Approved inspection agencies. The *code official* is authorized to accept reports of third-party inspection agencies not affiliated with the *building* design or construction, provided that such agencies are *approved* as to qualifications and reliability relevant to the *building* components and systems that they are inspecting.

R105.5 Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the *code official* when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

R105.6 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

SECTION R106
NOTICE OF APPROVAL

R106.1 Approval. After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the *code official*.

R106.2 Revocation. The *code official* is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the *building* or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION R107
VALIDITY

R107.1 General. If a portion of this code is held to be illegal or void, such a decision shall not affect the validity of the remainder of this code.

SECTION R108
REFERENCED STANDARDS

R108.1 Referenced codes and standards. The codes and standards referenced in this code shall be those indicated in Chapter 6, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections R108.1.1 and R108.1.2.

R108.1.1 Conflicts. Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

R108.1.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

R108.2 Application of references. References to chapter or section numbers, or to provisions not specifically identified

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by number, shall be construed to refer to such chapter, section or provision of this code.

R108.3 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

SECTION R109
STOP WORK ORDER

R109.1 Authority. Where the *code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a dangerous or unsafe manner, the *code official* is authorized to issue a stop work order.

R109.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property, the owner's authorized agent or the person performing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume.

R109.3 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

R109.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fines established by the authority having jurisdiction.

SECTION R110
MEANS OF APPEALS

R110.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the code official.

R110.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equivalent or better form of construction is proposed. The board shall not have authority to waive requirements of this code or interpret the administration of this code.

R110.3 Qualifications. The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction.

R110.4 Administration. The code official shall take immediate action in accordance with the decision of the board.

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CHAPTER 2 [RE]
DEFINITIONS

User note:

About this chapter: *Codes, by their very nature, are technical documents. Every word, term and punctuation mark can add to or change the meaning of a technical requirement. It is necessary to maintain a consensus on the specific meaning of each term contained in the code. Chapter 2 performs this function by stating clearly what specific terms mean for the purpose of the code.*

SECTION R201
GENERAL

R201.1 Scope. Unless stated otherwise, the following words and terms in this code shall have the meanings indicated in this chapter.

R201.2 Interchangeability. Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural includes the singular.

R201.3 Terms defined in other codes. Terms that are not defined in this code but are defined in the *International Building Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *International Plumbing Code* or the *International Residential Code* shall have the meanings ascribed to them in those codes.

R201.4 Terms not defined. Terms not defined by this chapter shall have ordinarily accepted meanings such as the context implies.

SECTION R202
GENERAL DEFINITIONS

ABOVE-GRADE WALL. A wall more than 50 percent above grade and enclosing *conditioned space*. This includes between-floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and *skylight* shafts.

ACCESS (TO). That which enables a device, appliance or equipment to be reached by *ready access* or by a means that first requires the removal or movement of a panel or similar obstruction.

ADDITION. An extension or increase in the *conditioned space* floor area, number of stories or height of a building or structure.

AIR BARRIER. One or more materials joined together in a continuous manner to restrict or prevent the passage of air through the *building thermal envelope* and its assemblies.

ALTERATION. Any construction, retrofit or renovation to an existing structure other than *repair* or *addition*. Also, a change in a building, electrical, gas, mechanical or plumbing system that involves an extension, addition or change to the arrangement, type or purpose of the original installation.

APPROVED. Acceptable to the *code official.*

APPROVED AGENCY. An established and recognized agency that is regularly engaged in conducting tests furnishing inspection services, or furnishing product certification, where such agency has been *approved* by the *code official.*

AUTOMATIC. Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current strength, pressure, temperature or mechanical configuration (see "*Manual*").

BASEMENT WALL. A wall 50 percent or more below grade and enclosing *conditioned space.*

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy, including any mechanical systems, service water-heating systems and electric power and lighting systems located on the building site and supporting the building.

BUILDING SITE. A contiguous area of land that is under the ownership or control of one entity.

BUILDING THERMAL ENVELOPE. The *basement walls, exterior walls,* floors, ceiling, roofs and any other *building* element assemblies that enclose *conditioned space* or provide a boundary between *conditioned space* and exempt or unconditioned space.

CAVITY INSULATION. Insulating material located between framing members.

CIRCULATING HOT WATER SYSTEM. A specifically designed water distribution system where one or more pumps are operated in the service hot water piping to circulate heated water from the water-heating equipment to fixtures and back to the water-heating equipment.

CLIMATE ZONE. A geographical region based on climatic criteria as specified in this code.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code or a duly authorized representative.

COMMERCIAL BUILDING. For this code, all buildings that are not included in the definition of "*Residential building*."

CONDITIONED FLOOR AREA. The horizontal projection of the floors associated with the *conditioned space*.

CONDITIONED SPACE. An area, room or space that is enclosed within the *building thermal envelope* and that is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from

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conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

CONTINUOUS AIR BARRIER. A combination of materials and assemblies that restrict or prevent the passage of air through the *building thermal envelope*.

CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior, or is integral to any opaque surface, of the *building* envelope.

CRAWL SPACE WALL. The opaque portion of a wall that encloses a crawl space and is partially or totally below grade.

CURTAIN WALL. Fenestration products used to create an external nonload-bearing wall that is designed to separate the exterior and interior environments.

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where one or more pumps prime the service hot water piping with heated water upon demand for hot water.

DIMMER. A control device that is capable of continuously varying the light output and energy use of light sources.

DUCT. A tube or conduit utilized for conveying air. The air passages of self-contained systems are not to be construed as air ducts.

DUCT SYSTEM. A continuous passageway for the transmission of air that, in addition to ducts, includes duct fittings, dampers, plenums, fans and accessory air-handling equipment and appliances.

DWELLING UNIT. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

DWELLING UNIT ENCLOSURE AREA. The sum of the area of ceiling, floors, and walls separating a *dwelling unit's conditioned space* from the exterior or from adjacent conditioned or unconditioned spaces. Wall height shall be measured from the finished floor of the *dwelling unit* to the underside of the floor above.

ENERGY ANALYSIS. A method for estimating the annual energy use of the *proposed design* and *standard reference design* based on estimates of energy use.

ENERGY COST. The total estimated annual cost for purchased energy for the building functions regulated by this code, including applicable demand charges.

ENERGY SIMULATION TOOL. An *approved* software program or calculation-based methodology that projects the annual energy use of a *building*.

ERI REFERENCE DESIGN. A version of the *rated design* that meets the minimum requirements of the 2006 *International Energy Conservation Code*.

EXTERIOR WALL. Walls including both *above-grade walls* and *basement walls*.

FENESTRATION. Products classified as either *vertical fenestration* or *skylights*.

Skylights. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal including unit skylights, tubular daylighting devices, and glazing materials in solariums, sunrooms, roofs and sloped walls.

Vertical fenestration. Windows that are fixed or operable, opaque doors, glazed doors, glazed block and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope of not less than 60 degrees (1.05 rad) from horizontal.

FENESTRATION PRODUCT, SITE-BUILT. A fenestration designed to be made up of field-glazed or field-assembled units using specific factory cut or otherwise factory-formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls and atrium roof systems.

HEATED SLAB. Slab-on-grade construction in which the heating elements, hydronic tubing, or hot air distribution system is in contact with, or placed within or under, the slab.

HIGH-EFFICACY LIGHT SOURCES. Any lamp with an efficacy of not less than 65 lumens per watt, or luminaires with an efficacy of not less than 45 lumens per watt.

HISTORIC BUILDING. Any building or structure that is one or more of the following:

1. Listed, or certified as eligible for listing by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, in the National Register of Historic Places.
2. Designated as historic under an applicable state or local law.
3. Certified as a contributing resource within a National Register-listed, state-designated or locally designated historic district.

INFILTRATION. The uncontrolled inward air leakage into a *building* caused by the pressure effects of wind or the effect of differences in the indoor and outdoor air density or both.

INSULATED SIDING. A type of continuous insulation with manufacturer-installed insulating material as an integral part of the cladding product having an *R*-value of not less than R-2.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, *approved* agency or other organization concerned with product evaluation that maintains periodic inspection of the production of such labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the *code official* and concerned with evaluation of products or

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services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

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MANUAL. Capable of being operated by personal intervention (see "*Automatic*").

OCCUPANT SENSOR CONTROL. An automatic control device that detects the presence or absence of people within an area and causes lighting, equipment or appliances to be regulated accordingly.

ON-SITE RENEWABLE ENERGY. Energy from renewable energy resources harvested at the building site.

OPAQUE DOOR. A door that is not less than 50-percent opaque in surface area.

PROPOSED DESIGN. A description of the proposed *building* used to estimate annual energy use for determining compliance based on total building performance.

RATED DESIGN. A description of the proposed *building* used to determine the energy rating index.

READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached without requiring the removal or movement of any panel or similar obstruction.

RENEWABLE ENERGY CERTIFICATE (REC). An instrument that represents the environmental attributes of one megawatt hour of renewable energy; also known as an energy attribute certificate (EAC).

RENEWABLE ENERGY RESOURCES. Energy derived from solar radiation, wind, waves, tides, landfill gas, biogas, biomass or extracted from hot fluid or steam heated within the earth.

REPAIR. The reconstruction or renewal of any part of an existing *building* for the purpose of its maintenance or to correct damage.

REROOFING. The process of recovering or replacing an existing roof covering. See "*Roof recover*" and "*Roof replacement*."

RESIDENTIAL BUILDING. For this code, includes detached one- and two-family dwellings and townhouses as well as *Group R*-2, *R*-3 and *R*-4 buildings three stories or less in height above grade plane.

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly includes the roof covering, underlayment and roof deck and can also include a thermal barrier, an ignition barrier, insulation or a vapor retarder.

ROOF RECOVER. The process of installing an additional roof covering over an existing roof covering without removing the existing roof covering.

ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

***R*-VALUE (THERMAL RESISTANCE).** The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area ($h \times ft^2 \times °F/Btu$) [$(m^2 \times K)/W$].

SERVICE WATER HEATING. Supply of hot water for purposes other than comfort heating.

SOLAR HEAT GAIN COEFFICIENT (SHGC). The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation that is then reradiated, conducted or convected into the space.

STANDARD REFERENCE DESIGN. A version of the *proposed design* that meets the minimum requirements of this code and is used to determine the maximum annual energy use requirement for compliance based on total building performance.

SUNROOM. A one-story structure attached to a dwelling with a glazing area in excess of 40 percent of the gross area of the structure's *exterior walls* and roof.

THERMAL DISTRIBUTION EFFICIENCY (TDE). The resistance to changes in air heat as air is conveyed through a distance of air duct. TDE is a heat loss calculation evaluating the difference in the heat of the air between the air duct inlet and outlet caused by differences in temperatures between the air in the duct and the duct material. TDE is expressed as a percent difference between the inlet and outlet heat in the duct.

THERMAL ISOLATION. Physical and space conditioning separation from *conditioned spaces*. The *conditioned spaces* shall be controlled as separate zones for heating and cooling or conditioned by separate equipment.

THERMOSTAT. An automatic control device used to maintain temperature at a fixed or adjustable setpoint.

***U*-FACTOR (THERMAL TRANSMITTANCE).** The coefficient of heat transmission (air to air) through a building component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films ($Btu/h \times ft^2 \times °F$) [$W/(m^2 \times K)$].

VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

VENTILATION AIR. That portion of supply air that comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

VISIBLE TRANSMITTANCE (VT). The ratio of visible light entering the space through the fenestration product assembly to the incident visible light. Visible Transmittance includes the effects of glazing material and frame and is expressed as a number between 0 and 1.

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VENTILATION AIR. That portion of supply air that comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

VISIBLE TRANSMITTANCE (VT). The ratio of visible light entering the space through the fenestration product assembly to the incident visible light. Visible Transmittance includes the effects of glazing material and frame and is expressed as a number between 0 and 1.

WHOLE HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air with outdoor air when operating continuously or through a programmed intermittent schedule to satisfy the whole house ventilation rates.

ZONE. A space or group of spaces within a *building* with heating or cooling requirements that are sufficiently similar so that desired conditions can be maintained throughout using a single controlling device.

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CHAPTER 3 [RE]
GENERAL REQUIREMENTS

User note:

About this chapter: *Chapter 3 addresses broadly applicable requirements that would not be at home in other chapters having more specific coverage of subject matter. This chapter establishes climate zone by US counties and territories and includes methodology for determining climate zones elsewhere. It also contains product rating, marking and installation requirements for materials such as insulation, windows, doors and siding.*

SECTION R301
CLIMATE ZONES

R301.1 General. *Climate zones* from Figure R301.1 or Table R301.1 shall be used for determining the applicable requirements from Chapter 4. Locations not indicated in Table R301.1 shall be assigned a *climate zone* in accordance with Section R301.3.

R301.2 Warm Humid counties. In Table R301.1, Warm Humid counties are identified by an asterisk.

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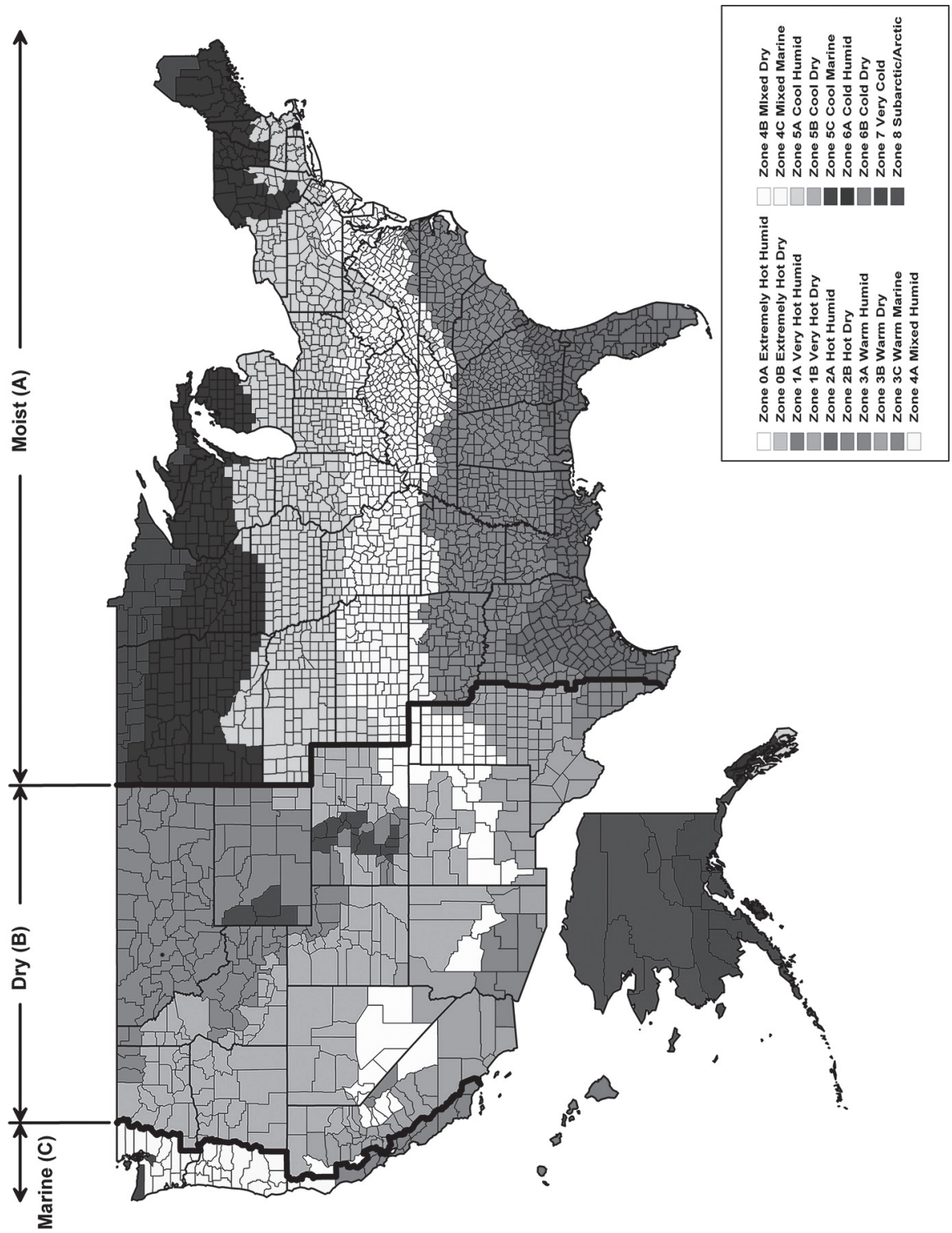


FIGURE R301.1
CLIMATE ZONES

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TABLE R301.1
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES
ALABAMA
3A Autauga*
2A Baldwin*
3A Barbour*
3A Bibb
3A Blount
3A Bullock*
3A Butler*
3A Calhoun
3A Chambers
3A Cherokee
3A Chilton
3A Choctaw*
3A Clarke*
3A Clay
3A Cleburne
2A Coffee*
3A Colbert
3A Conecuh*
3A Coosa
2A Covington*
3A Crenshaw*
3A Cullman
2A Dale*
3A Dallas*
3A DeKalb
3A Elmore*
2A Escambia*
3A Etowah
3A Fayette
3A Franklin
2A Geneva*
3A Greene
3A Hale
2A Henry*
2A Houston*
3A Jackson
3A Jefferson
3A Lamar
3A Lauderdale
3A Lawrence
3A Lee
3A Limestone
3A Lowndes*
3A Macon*
3A Madison
3A Marengo*
3A Marion
3A Marshall
2A Mobile*
3A Monroe*
3A Montgomery*
3A Morgan
3A Perry*
3A Pickens
3A Pike*
3A Randolph
3A Russell*
3A Shelby
3A St. Clair
3A Sumter
3A Talladega
3A Tallapoosa
3A Tuscaloosa
3A Walker
3A Washington*
3A Wilcox*
3A Winston
ALASKA
7 Aleutians East
7 Aleutians West
7 Anchorage
7 Bethel
7 Bristol Bay
8 Denali
7 Dillingham
8 Fairbanks North Star
6A Haines
6A Juneau
7 Kenai Peninsula
5C Ketchikan Gateway
6A Kodiak Island
7 Lake and Peninsula
7 Matanuska-Susitna
8 Nome
8 North Slope
8 Northwest Arctic

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ALASKA *(continued)*
5C Prince of Wales Outer Ketchikan
5C Sitka
6A Skagway-Hoonah-Angoon
8 Southeast Fairbanks
7 Valdez-Cordova
8 Wade Hampton
6A Wrangell-Petersburg
7 Yakutat
8 Yukon-Koyukuk
ARIZONA
5B Apache
3B Cochise
5B Coconino
4B Gila
3B Graham
3B Greenlee
2B La Paz
2B Maricopa
3B Mohave
5B Navajo
2B Pima
2B Pinal
3B Santa Cruz
4B Yavapai
2B Yuma
ARKANSAS
3A Arkansas
3A Ashley
4A Baxter
4A Benton
4A Boone
3A Bradley
3A Calhoun
4A Carroll
3A Chicot
3A Clark
3A Clay
3A Cleburne
3A Cleveland
3A Columbia*
3A Conway
3A Craighead
3A Crawford
3A Crittenden
3A Cross
3A Dallas
3A Desha
3A Drew
3A Faulkner
3A Franklin
4A Fulton
3A Garland
3A Grant
3A Greene
3A Hempstead*
3A Hot Spring
3A Howard
3A Independence
4A Izard
3A Jackson
3A Jefferson
3A Johnson
3A Lafayette*
3A Lawrence
3A Lee
3A Lincoln
3A Little River*
3A Logan
3A Lonoke
4A Madison
4A Marion
3A Miller*
3A Mississippi
3A Monroe
3A Montgomery
3A Nevada
4A Newton
3A Ouachita
3A Perry
3A Phillips
3A Pike
3A Poinsett
3A Polk
3A Pope
3A Prairie
3A Pulaski
3A Randolph

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ARKANSAS *(continued)*
3A Saline
3A Scott
4A Searcy
3A Sebastian
3A Sevier*
3A Sharp
3A St. Francis
4A Stone
3A Union*
3A Van Buren
4A Washington
3A White
3A Woodruff
3A Yell
CALIFORNIA
3C Alameda
6B Alpine
4B Amador
3B Butte
4B Calaveras
3B Colusa
3B Contra Costa
4C Del Norte
4B El Dorado
3B Fresno
3B Glenn
4C Humboldt
2B Imperial
4B Inyo
3B Kern
3B Kings
4B Lake
5B Lassen
3B Los Angeles
3B Madera
3C Marin
4B Mariposa
3C Mendocino
3B Merced
5B Modoc
6B Mono
3C Monterey
3C Napa
5B Nevada
3B Orange
3B Placer
5B Plumas
3B Riverside
3B Sacramento
3C San Benito
3B San Bernardino
3B San Diego
3C San Francisco
3B San Joaquin
3C San Luis Obispo
3C San Mateo
3C Santa Barbara
3C Santa Clara
3C Santa Cruz
3B Shasta
5B Sierra
5B Siskiyou
3B Solano
3C Sonoma
3B Stanislaus
3B Sutter
3B Tehama
4B Trinity
3B Tulare
4B Tuolumne
3C Ventura
3B Yolo
3B Yuba
COLORADO
5B Adams
6B Alamosa
5B Arapahoe
6B Archuleta
4B Baca
4B Bent
5B Boulder
5B Broomfield
6B Chaffee
5B Cheyenne
7 Clear Creek
6B Conejos
6B Costilla
5B Crowley

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
COLORADO *(continued)*
5B Custer
5B Delta
5B Denver
6B Dolores
5B Douglas
6B Eagle
5B Elbert
5B El Paso
5B Fremont
5B Garfield
5B Gilpin
7 Grand
7 Gunnison
7 Hinsdale
5B Huerfano
7 Jackson
5B Jefferson
5B Kiowa
5B Kit Carson
7 Lake
5B La Plata
5B Larimer
4B Las Animas
5B Lincoln
5B Logan
5B Mesa
7 Mineral
6B Moffat
5B Montezuma
5B Montrose
5B Morgan
4B Otero
6B Ouray
7 Park
5B Phillips
7 Pitkin
4B Prowers
5B Pueblo
6B Rio Blanco
7 Rio Grande
7 Routt
6B Saguache
7 San Juan
6B San Miguel
5B Sedgwick
7 Summit
5B Teller
5B Washington
5B Weld
5B Yuma
CONNECTICUT
5A (all)
DELAWARE
4A (all)
DISTRICT OF COLUMBIA
4A (all)
FLORIDA
2A Alachua*
2A Baker*
2A Bay*
2A Bradford*
2A Brevard*
1A Broward*
2A Calhoun*
2A Charlotte*
2A Citrus*
2A Clay*
2A Collier*
2A Columbia*
2A DeSoto*
2A Dixie*
2A Duval*
2A Escambia*
2A Flagler*
2A Franklin*
2A Gadsden*
2A Gilchrist*
2A Glades*
2A Gulf*
2A Hamilton*
2A Hardee*
2A Hendry*
2A Hernando*
2A Highlands*
2A Hillsborough*
2A Holmes*
2A Indian River*
2A Jackson*

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
FLORIDA *(continued)*
2A Jefferson*
2A Lafayette*
2A Lake*
2A Lee*
2A Leon*
2A Levy*
2A Liberty*
2A Madison*
2A Manatee*
2A Marion*
2A Martin*
1A Miami-Dade*
1A Monroe*
2A Nassau*
2A Okaloosa*
2A Okeechobee*
2A Orange*
2A Osceola*
1A Palm Beach*
2A Pasco*
2A Pinellas*
2A Polk*
2A Putnam*
2A Santa Rosa*
2A Sarasota*
2A Seminole*
2A St. Johns*
2A St. Lucie*
2A Sumter*
2A Suwannee*
2A Taylor*
2A Union*
2A Volusia*
2A Wakulla*
2A Walton*
2A Washington*
GEORGIA
2A Appling*
2A Atkinson*
2A Bacon*
2A Baker*
3A Baldwin
3A Banks
3A Barrow
3A Bartow
3A Ben Hill*
2A Berrien*
3A Bibb
3A Bleckley*
2A Brantley*
2A Brooks*
2A Bryan*
3A Bulloch*
3A Burke
3A Butts
2A Calhoun*
2A Camden*
3A Candler*
3A Carroll
3A Catoosa
2A Charlton*
2A Chatham*
3A Chattahoochee*
3A Chattooga
3A Cherokee
3A Clarke
3A Clay*
3A Clayton
2A Clinch*
3A Cobb
2A Coffee*
2A Colquitt*
3A Columbia
2A Cook*
3A Coweta
3A Crawford
3A Crisp*
3A Dade
3A Dawson
2A Decatur*
3A DeKalb
3A Dodge*
3A Dooly*
2A Dougherty*
3A Douglas
2A Early*
2A Echols*
2A Effingham*

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
GEORGIA *(continued)*
3A Elbert
3A Emanuel*
2A Evans*
3A Fannin
3A Fayette
3A Floyd
3A Forsyth
3A Franklin
3A Fulton
3A Gilmer
3A Glascock
2A Glynn*
3A Gordon
2A Grady*
3A Greene
3A Gwinnett
3A Habersham
3A Hall
3A Hancock
3A Haralson
3A Harris
3A Hart
3A Heard
3A Henry
3A Houston*
3A Irwin*
3A Jackson
3A Jasper
2A Jeff Davis*
3A Jefferson
3A Jenkins*
3A Johnson*
3A Jones
3A Lamar
2A Lanier*
3A Laurens*
3A Lee*
2A Liberty*
3A Lincoln
2A Long*
2A Lowndes*
3A Lumpkin
3A Macon*
3A Madison
3A Marion*
3A McDuffie
2A McIntosh*
3A Meriwether
2A Miller*
2A Mitchell*
3A Monroe
3A Montgomery*
3A Morgan
3A Murray
3A Muscogee
3A Newton
3A Oconee
3A Oglethorpe
3A Paulding
3A Peach*
3A Pickens
2A Pierce*
3A Pike
3A Polk
3A Pulaski*
3A Putnam
3A Quitman*
3A Rabun
3A Randolph*
3A Richmond
3A Rockdale
3A Schley*
3A Screven*
2A Seminole*
3A Spalding
3A Stephens
3A Stewart*
3A Sumter*
3A Talbot
3A Taliaferro
2A Tattnall*
3A Taylor*
3A Telfair*
3A Terrell*
2A Thomas*
2A Tift*
2A Toombs*
3A Towns

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
GEORGIA *(continued)*
3A Treutlen*
3A Troup
3A Turner*
3A Twiggs*
3A Union
3A Upson
3A Walker
3A Walton
2A Ware*
3A Warren
3A Washington
2A Wayne*
3A Webster*
3A Wheeler*
3A White
3A Whitfield
3A Wilcox*
3A Wilkes
3A Wilkinson
2A Worth*
HAWAII
1A (all)*
IDAHO
5B Ada
6B Adams
6B Bannock
6B Bear Lake
5B Benewah
6B Bingham
6B Blaine
6B Boise
6B Bonner
6B Bonneville
6B Boundary
6B Butte
6B Camas
5B Canyon
6B Caribou
5B Cassia
6B Clark
5B Clearwater
6B Custer
5B Elmore
6B Franklin
6B Fremont
5B Gem
5B Gooding
5B Idaho
6B Jefferson
5B Jerome
5B Kootenai
5B Latah
6B Lemhi
5B Lewis
5B Lincoln
6B Madison
5B Minidoka
5B Nez Perce
6B Oneida
5B Owyhee
5B Payette
5B Power
5B Shoshone
6B Teton
5B Twin Falls
6B Valley
5B Washington
ILLINOIS
5A Adams
4A Alexander
4A Bond
5A Boone
5A Brown
5A Bureau
4A Calhoun
5A Carroll
5A Cass
5A Champaign
4A Christian
4A Clark
4A Clay
4A Clinton
4A Coles
5A Cook
4A Crawford
4A Cumberland
5A DeKalb
5A De Witt

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
ILLINOIS *(continued)*
5A Douglas
5A DuPage
5A Edgar
4A Edwards
4A Effingham
4A Fayette
5A Ford
4A Franklin
5A Fulton
4A Gallatin
4A Greene
5A Grundy
4A Hamilton
5A Hancock
4A Hardin
5A Henderson
5A Henry
5A Iroquois
4A Jackson
4A Jasper
4A Jefferson
4A Jersey
5A Jo Daviess
4A Johnson
5A Kane
5A Kankakee
5A Kendall
5A Knox
5A Lake
5A La Salle
4A Lawrence
5A Lee
5A Livingston
5A Logan
5A Macon
4A Macoupin
4A Madison
4A Marion
5A Marshall
5A Mason
4A Massac
5A McDonough
5A McHenry
5A McLean
5A Menard
5A Mercer
4A Monroe
4A Montgomery
5A Morgan
5A Moultrie
5A Ogle
5A Peoria
4A Perry
5A Piatt
5A Pike
4A Pope
4A Pulaski
5A Putnam
4A Randolph
4A Richland
5A Rock Island
4A Saline
5A Sangamon
5A Schuyler
5A Scott
4A Shelby
5A Stark
4A St. Clair
5A Stephenson
5A Tazewell
4A Union
5A Vermilion
4A Wabash
5A Warren
4A Washington
4A Wayne
4A White
5A Whiteside
5A Will
4A Williamson
5A Winnebago
5A Woodford
INDIANA
5A Adams
5A Allen
4A Bartholomew
5A Benton
5A Blackford
5A Boone
4A Brown

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
INDIANA *(continued)*
5A Carroll
5A Cass
4A Clark
4A Clay
5A Clinton
4A Crawford
4A Daviess
4A Dearborn
4A Decatur
5A De Kalb
5A Delaware
4A Dubois
5A Elkhart
4A Fayette
4A Floyd
5A Fountain
4A Franklin
5A Fulton
4A Gibson
5A Grant
4A Greene
5A Hamilton
5A Hancock
4A Harrison
4A Hendricks
5A Henry
5A Howard
5A Huntington
4A Jackson
5A Jasper
5A Jay
4A Jefferson
4A Jennings
4A Johnson
4A Knox
5A Kosciusko
5A LaGrange
5A Lake
5A LaPorte
4A Lawrence
5A Madison
4A Marion
5A Marshall
4A Martin
5A Miami
4A Monroe
5A Montgomery
4A Morgan
5A Newton
5A Noble
4A Ohio
4A Orange
4A Owen
5A Parke
4A Perry
4A Pike
5A Porter
4A Posey
5A Pulaski
4A Putnam
5A Randolph
4A Ripley
4A Rush
4A Scott
4A Shelby
4A Spencer
5A Starke
5A Steuben
5A St. Joseph
4A Sullivan
4A Switzerland
5A Tippecanoe
5A Tipton
4A Union
4A Vanderburgh
5A Vermillion
4A Vigo
5A Wabash
5A Warren
4A Warrick
4A Washington
5A Wayne
5A Wells
5A White
5A Whitley
IOWA
5A Adair
5A Adams

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
IOWA *(continued)*
5A Allamakee
5A Appanoose
5A Audubon
5A Benton
6A Black Hawk
5A Boone
5A Bremer
5A Buchanan
5A Buena Vista
5A Butler
5A Calhoun
5A Carroll
5A Cass
5A Cedar
6A Cerro Gordo
5A Cherokee
5A Chickasaw
5A Clarke
6A Clay
5A Clayton
5A Clinton
5A Crawford
5A Dallas
5A Davis
5A Decatur
5A Delaware
5A Des Moines
6A Dickinson
5A Dubuque
6A Emmet
5A Fayette
5A Floyd
5A Franklin
5A Fremont
5A Greene
5A Grundy
5A Guthrie
5A Hamilton
6A Hancock
5A Hardin
5A Harrison
5A Henry
5A Howard
5A Humboldt
5A Ida
5A Iowa
5A Jackson
5A Jasper
5A Jefferson
5A Johnson
5A Jones
5A Keokuk
6A Kossuth
5A Lee
5A Linn
5A Louisa
5A Lucas
6A Lyon
5A Madison
5A Mahaska
5A Marion
5A Marshall
5A Mills
6A Mitchell
5A Monona
5A Monroe
5A Montgomery
5A Muscatine
6A O'Brien
6A Osceola
5A Page
6A Palo Alto
5A Plymouth
5A Pocahontas
5A Polk
5A Pottawattamie
5A Poweshiek
5A Ringgold
5A Sac
5A Scott
5A Shelby
6A Sioux
5A Story
5A Tama
5A Taylor
5A Union
5A Van Buren
5A Wapello

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
IOWA *(continued)*
5A Warren
5A Washington
5A Wayne
5A Webster
6A Winnebago
5A Winneshiek
5A Woodbury
6A Worth
5A Wright
KANSAS
4A Allen
4A Anderson
4A Atchison
4A Barber
4A Barton
4A Bourbon
4A Brown
4A Butler
4A Chase
4A Chautauqua
4A Cherokee
5A Cheyenne
4A Clark
4A Clay
4A Cloud
4A Coffey
4A Comanche
4A Cowley
4A Crawford
5A Decatur
4A Dickinson
4A Doniphan
4A Douglas
4A Edwards
4A Elk
4A Ellis
4A Ellsworth
4A Finney
4A Ford
4A Franklin
4A Geary
5A Gove
4A Graham
4A Grant
4A Gray
5A Greeley
4A Greenwood
4A Hamilton
4A Harper
4A Harvey
4A Haskell
4A Hodgeman
4A Jackson
4A Jefferson
5A Jewell
4A Johnson
4A Kearny
4A Kingman
4A Kiowa
4A Labette
4A Lane
4A Leavenworth
4A Lincoln
4A Linn
5A Logan
4A Lyon
4A Marion
4A Marshall
4A McPherson
4A Meade
4A Miami
4A Mitchell
4A Montgomery
4A Morris
4A Morton
4A Nemaha
4A Neosho
4A Ness
5A Norton
4A Osage
4A Osborne
4A Ottawa
4A Pawnee
5A Phillips
4A Pottawatomie
4A Pratt
5A Rawlins
4A Reno

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
KANSAS *(continued)*
5A Republic
4A Rice
4A Riley
4A Rooks
4A Rush
4A Russell
4A Saline
5A Scott
4A Sedgwick
4A Seward
4A Shawnee
5A Sheridan
5A Sherman
5A Smith
4A Stafford
4A Stanton
4A Stevens
4A Sumner
5A Thomas
4A Trego
4A Wabaunsee
5A Wallace
4A Washington
5A Wichita
4A Wilson
4A Woodson
4A Wyandotte
KENTUCKY
4A (all)
LOUISIANA
2A Acadia*
2A Allen*
2A Ascension*
2A Assumption*
2A Avoyelles*
2A Beauregard*
3A Bienville*
3A Bossier*
3A Caddo*
2A Calcasieu*
3A Caldwell*
2A Cameron*
3A Catahoula*
3A Claiborne*
3A Concordia*
3A De Soto*
2A East Baton Rouge*
3A East Carroll
2A East Feliciana*
2A Evangeline*
3A Franklin*
3A Grant*
2A Iberia*
2A Iberville*
3A Jackson*
2A Jefferson*
2A Jefferson Davis*
2A Lafayette*
2A Lafourche*
3A La Salle*
3A Lincoln*
2A Livingston*
3A Madison*
3A Morehouse
3A Natchitoches*
2A Orleans*
3A Ouachita*
2A Plaquemines*
2A Pointe Coupee*
2A Rapides*
3A Red River*
3A Richland*
3A Sabine*
2A St. Bernard*
2A St. Charles*
2A St. Helena*
2A St. James*
2A St. John the Baptist*
2A St. Landry*
2A St. Martin*
2A St. Mary*
2A St. Tammany*
2A Tangipahoa*
3A Tensas*
2A Terrebonne*
3A Union*
2A Vermilion*
3A Vernon*

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
LOUISIANA *(continued)*
2A Washington*
3A Webster*
2A West Baton Rouge*
3A West Carroll
2A West Feliciana*
3A Winn*
MAINE
6A Androscoggin
7 Aroostook
6A Cumberland
6A Franklin
6A Hancock
6A Kennebec
6A Knox
6A Lincoln
6A Oxford
6A Penobscot
6A Piscataquis
6A Sagadahoc
6A Somerset
6A Waldo
6A Washington
6A York
MARYLAND
5A Allegany
4A Anne Arundel
4A Baltimore
4A Baltimore (city)
4A Calvert
4A Caroline
4A Carroll
4A Cecil
4A Charles
4A Dorchester
4A Frederick
5A Garrett
4A Harford
4A Howard
4A Kent
4A Montgomery
4A Prince George's
4A Queen Anne's
4A Somerset
4A St. Mary's
4A Talbot
4A Washington
4A Wicomico
4A Worcester
MASSACHUSETTS
5A (all)
MICHIGAN
6A Alcona
6A Alger
5A Allegan
6A Alpena
6A Antrim
6A Arenac
6A Baraga
5A Barry
5A Bay
6A Benzie
5A Berrien
5A Branch
5A Calhoun
5A Cass
6A Charlevoix
6A Cheboygan
6A Chippewa
6A Clare
5A Clinton
6A Crawford
6A Delta
6A Dickinson
5A Eaton
6A Emmet
5A Genesee
6A Gladwin
6A Gogebic
6A Grand Traverse
5A Gratiot
5A Hillsdale
6A Houghton
5A Huron
5A Ingham
5A Ionia
6A Iosco
6A Iron
6A Isabella

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MICHIGAN *(continued)*
5A Jackson
5A Kalamazoo
6A Kalkaska
5A Kent
7 Keweenaw
6A Lake
5A Lapeer
6A Leelanau
5A Lenawee
5A Livingston
6A Luce
6A Mackinac
5A Macomb
6A Manistee
7 Marquette
6A Mason
6A Mecosta
6A Menominee
5A Midland
6A Missaukee
5A Monroe
5A Montcalm
6A Montmorency
5A Muskegon
6A Newaygo
5A Oakland
6A Oceana
6A Ogemaw
6A Ontonagon
6A Osceola
6A Oscoda
6A Otsego
5A Ottawa
6A Presque Isle
6A Roscommon
5A Saginaw
5A Sanilac
6A Schoolcraft
5A Shiawassee
5A St. Clair
5A St. Joseph
5A Tuscola
5A Van Buren
5A Washtenaw
5A Wayne
6A Wexford
MINNESOTA
7 Aitkin
6A Anoka
6A Becker
7 Beltrami
6A Benton
6A Big Stone
6A Blue Earth
6A Brown
7 Carlton
6A Carver
7 Cass
6A Chippewa
6A Chisago
6A Clay
7 Clearwater
7 Cook
6A Cottonwood
7 Crow Wing
6A Dakota
6A Dodge
6A Douglas
6A Faribault
5A Fillmore
6A Freeborn
6A Goodhue
6A Grant
6A Hennepin
5A Houston
7 Hubbard
6A Isanti
7 Itasca
6A Jackson
6A Kanabec
6A Kandiyohi
7 Kittson
7 Koochiching
6A Lac qui Parle
7 Lake
7 Lake of the Woods
6A Le Sueur
6A Lincoln

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MINNESOTA *(continued)*
6A Lyon
7 Mahnomen
7 Marshall
6A Martin
6A McLeod
6A Meeker
6A Mille Lacs
6A Morrison
6A Mower
6A Murray
6A Nicollet
6A Nobles
7 Norman
6A Olmsted
6A Otter Tail
7 Pennington
7 Pine
6A Pipestone
7 Polk
6A Pope
6A Ramsey
7 Red Lake
6A Redwood
6A Renville
6A Rice
6A Rock
7 Roseau
6A Scott
6A Sherburne
6A Sibley
6A Stearns
6A Steele
6A Stevens
7 St. Louis
6A Swift
6A Todd
6A Traverse
6A Wabasha
7 Wadena
6A Waseca
6A Washington
6A Watonwan
6A Wilkin
5A Winona
6A Wright
6A Yellow Medicine
MISSISSIPPI
3A Adams*
3A Alcorn
3A Amite*
3A Attala
3A Benton
3A Bolivar
3A Calhoun
3A Carroll
3A Chickasaw
3A Choctaw
3A Claiborne*
3A Clarke
3A Clay
3A Coahoma
3A Copiah*
3A Covington*
3A DeSoto
3A Forrest*
3A Franklin*
2A George*
3A Greene*
3A Grenada
2A Hancock*
2A Harrison*
3A Hinds*
3A Holmes
3A Humphreys
3A Issaquena
3A Itawamba
2A Jackson*
3A Jasper
3A Jefferson*
3A Jefferson Davis*
3A Jones*
3A Kemper
3A Lafayette
3A Lamar*
3A Lauderdale
3A Lawrence*
3A Leake
3A Lee

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MISSISSIPPI *(continued)*
3A Leflore
3A Lincoln*
3A Lowndes
3A Madison
3A Marion*
3A Marshall
3A Monroe
3A Montgomery
3A Neshoba
3A Newton
3A Noxubee
3A Oktibbeha
3A Panola
2A Pearl River*
3A Perry*
3A Pike*
3A Pontotoc
3A Prentiss
3A Quitman
3A Rankin*
3A Scott
3A Sharkey
3A Simpson*
3A Smith*
2A Stone*
3A Sunflower
3A Tallahatchie
3A Tate
3A Tippah
3A Tishomingo
3A Tunica
3A Union
3A Walthall*
3A Warren*
3A Washington
3A Wayne*
3A Webster
3A Wilkinson*
3A Winston
3A Yalobusha
3A Yazoo
MISSOURI
5A Adair
5A Andrew
5A Atchison
4A Audrain
4A Barry
4A Barton
4A Bates
4A Benton
4A Bollinger
4A Boone
4A Buchanan
4A Butler
4A Caldwell
4A Callaway
4A Camden
4A Cape Girardeau
4A Carroll
4A Carter
4A Cass
4A Cedar
4A Chariton
4A Christian
5A Clark
4A Clay
4A Clinton
4A Cole
4A Cooper
4A Crawford
4A Dade
4A Dallas
5A Daviess
5A DeKalb
4A Dent
4A Douglas
3A Dunklin
4A Franklin
4A Gasconade
5A Gentry
4A Greene
5A Grundy
5A Harrison
4A Henry
4A Hickory
5A Holt
4A Howard
4A Howell

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
MISSOURI *(continued)*
4A Iron
4A Jackson
4A Jasper
4A Jefferson
4A Johnson
5A Knox
4A Laclede
4A Lafayette
4A Lawrence
5A Lewis
4A Lincoln
5A Linn
5A Livingston
5A Macon
4A Madison
4A Maries
5A Marion
4A McDonald
5A Mercer
4A Miller
4A Mississippi
4A Moniteau
4A Monroe
4A Montgomery
4A Morgan
4A New Madrid
4A Newton
5A Nodaway
4A Oregon
4A Osage
4A Ozark
3A Pemiscot
4A Perry
4A Pettis
4A Phelps
5A Pike
4A Platte
4A Polk
4A Pulaski
5A Putnam
5A Ralls
4A Randolph
4A Ray
4A Reynolds
4A Ripley
4A Saline
5A Schuyler
5A Scotland
4A Scott
4A Shannon
5A Shelby
4A St. Charles
4A St. Clair
4A St. Francois
4A St. Louis
4A St. Louis (city)
4A Ste. Genevieve
4A Stoddard
4A Stone
5A Sullivan
4A Taney
4A Texas
4A Vernon
4A Warren
4A Washington
4A Wayne
4A Webster
5A Worth
4A Wright
MONTANA
6B (all)
NEBRASKA
5A (all)
NEVADA
4B Carson City (city)
5B Churchill
3B Clark
4B Douglas
5B Elko
4B Esmeralda
5B Eureka
5B Humboldt
5B Lander
4B Lincoln
4B Lyon
4B Mineral
4B Nye
5B Pershing

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NEVADA *(continued)*
5B Storey
5B Washoe
5B White Pine
NEW HAMPSHIRE
6A Belknap
6A Carroll
5A Cheshire
6A Coos
6A Grafton
5A Hillsborough
5A Merrimack
5A Rockingham
5A Strafford
6A Sullivan
NEW JERSEY
4A Atlantic
5A Bergen
4A Burlington
4A Camden
4A Cape May
4A Cumberland
4A Essex
4A Gloucester
4A Hudson
5A Hunterdon
4A Mercer
4A Middlesex
4A Monmouth
5A Morris
4A Ocean
5A Passaic
4A Salem
5A Somerset
5A Sussex
4A Union
5A Warren
NEW MEXICO
4B Bernalillo
4B Catron
3B Chaves
4B Cibola
5B Colfax
4B Curry
4B DeBaca
3B Doña Ana
3B Eddy
4B Grant
4B Guadalupe
5B Harding
3B Hidalgo
3B Lea
4B Lincoln
5B Los Alamos
3B Luna
5B McKinley
5B Mora
3B Otero
4B Quay
5B Rio Arriba
4B Roosevelt
5B Sandoval
5B San Juan
5B San Miguel
5B Santa Fe
3B Sierra
4B Socorro
5B Taos
5B Torrance
4B Union
4B Valencia
NEW YORK
5A Albany
5A Allegany
4A Bronx
5A Broome
5A Cattaraugus
5A Cayuga
5A Chautauqua
5A Chemung
6A Chenango
6A Clinton
5A Columbia
5A Cortland
6A Delaware
5A Dutchess
5A Erie
6A Essex
6A Franklin

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NEW YORK *(continued)*
6A Fulton
5A Genesee
5A Greene
6A Hamilton
6A Herkimer
6A Jefferson
4A Kings
6A Lewis
5A Livingston
6A Madison
5A Monroe
6A Montgomery
4A Nassau
4A New York
5A Niagara
6A Oneida
5A Onondaga
5A Ontario
5A Orange
5A Orleans
5A Oswego
6A Otsego
5A Putnam
4A Queens
5A Rensselaer
4A Richmond
5A Rockland
5A Saratoga
5A Schenectady
5A Schoharie
5A Schuyler
5A Seneca
5A Steuben
6A St. Lawrence
4A Suffolk
6A Sullivan
5A Tioga
5A Tompkins
6A Ulster
6A Warren
5A Washington
5A Wayne
4A Westchester
5A Wyoming
5A Yates
NORTH CAROLINA
3A Alamance
3A Alexander
5A Alleghany
3A Anson
5A Ashe
5A Avery
3A Beaufort
3A Bertie
3A Bladen
3A Brunswick*
4A Buncombe
4A Burke
3A Cabarrus
4A Caldwell
3A Camden
3A Carteret*
3A Caswell
3A Catawba
3A Chatham
3A Cherokee
3A Chowan
3A Clay
3A Cleveland
3A Columbus*
3A Craven
3A Cumberland
3A Currituck
3A Dare
3A Davidson
3A Davie
3A Duplin
3A Durham
3A Edgecombe
3A Forsyth
3A Franklin
3A Gaston
3A Gates
4A Graham
3A Granville
3A Greene
3A Guilford
3A Halifax

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NORTH CAROLINA *(continued)*
3A Harnett
4A Haywood
4A Henderson
3A Hertford
3A Hoke
3A Hyde
3A Iredell
4A Jackson
3A Johnston
3A Jones
3A Lee
3A Lenoir
3A Lincoln
4A Macon
4A Madison
3A Martin
4A McDowell
3A Mecklenburg
4A Mitchell
3A Montgomery
3A Moore
3A Nash
3A New Hanover*
3A Northampton
3A Onslow*
3A Orange
3A Pamlico
3A Pasquotank
3A Pender*
3A Perquimans
3A Person
3A Pitt
3A Polk
3A Randolph
3A Richmond
3A Robeson
3A Rockingham
3A Rowan
3A Rutherford
3A Sampson
3A Scotland
3A Stanly
4A Stokes
4A Surry
4A Swain
4A Transylvania
3A Tyrrell
3A Union
3A Vance
3A Wake
3A Warren
3A Washington
5A Watauga
3A Wayne
3A Wilkes
3A Wilson
4A Yadkin
5A Yancey
NORTH DAKOTA
6A Adams
6A Barnes
7 Benson
6A Billings
7 Bottineau
6A Bowman
7 Burke
6A Burleigh
6A Cass
7 Cavalier
6A Dickey
7 Divide
6A Dunn
6A Eddy
6A Emmons
6A Foster
6A Golden Valley
7 Grand Forks
6A Grant
6A Griggs
6A Hettinger
6A Kidder
6A LaMoure
6A Logan
7 McHenry
6A McIntosh
6A McKenzie
6A McLean
6A Mercer

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
NORTH DAKOTA *(continued)*
6A Morton
6A Mountrail
7 Nelson
6A Oliver
7 Pembina
7 Pierce
7 Ramsey
6A Ransom
7 Renville
6A Richland
7 Rolette
6A Sargent
6A Sheridan
6A Sioux
6A Slope
6A Stark
6A Steele
6A Stutsman
7 Towner
6A Traill
7 Walsh
7 Ward
6A Wells
6A Williams
OHIO
4A Adams
5A Allen
5A Ashland
5A Ashtabula
4A Athens
5A Auglaize
5A Belmont
4A Brown
4A Butler
5A Carroll
5A Champaign
5A Clark
4A Clermont
4A Clinton
5A Columbiana
5A Coshocton
5A Crawford
5A Cuyahoga
5A Darke
5A Defiance
5A Delaware
5A Erie
5A Fairfield
4A Fayette
4A Franklin
5A Fulton
4A Gallia
5A Geauga
4A Greene
5A Guernsey
4A Hamilton
5A Hancock
5A Hardin
5A Harrison
5A Henry
4A Highland
4A Hocking
5A Holmes
5A Huron
4A Jackson
5A Jefferson
5A Knox
5A Lake
4A Lawrence
5A Licking
5A Logan
5A Lorain
5A Lucas
4A Madison
5A Mahoning
5A Marion
5A Medina
4A Meigs
5A Mercer
5A Miami
5A Monroe
5A Montgomery
5A Morgan
5A Morrow
5A Muskingum
5A Noble
5A Ottawa
5A Paulding

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
OHIO *(continued)*
5A Perry
4A Pickaway
4A Pike
5A Portage
5A Preble
5A Putnam
5A Richland
4A Ross
5A Sandusky
4A Scioto
5A Seneca
5A Shelby
5A Stark
5A Summit
5A Trumbull
5A Tuscarawas
5A Union
5A Van Wert
4A Vinton
4A Warren
4A Washington
5A Wayne
5A Williams
5A Wood
5A Wyandot
OKLAHOMA
3A Adair
4A Alfalfa
3A Atoka
4B Beaver
3A Beckham
3A Blaine
3A Bryan
3A Caddo
3A Canadian
3A Carter
3A Cherokee
3A Choctaw
4B Cimarron
3A Cleveland
3A Coal
3A Comanche
3A Cotton
4A Craig
3A Creek
3A Custer
4A Delaware
3A Dewey
4A Ellis
4A Garfield
3A Garvin
3A Grady
4A Grant
3A Greer
3A Harmon
4A Harper
3A Haskell
3A Hughes
3A Jackson
3A Jefferson
3A Johnston
4A Kay
3A Kingfisher
3A Kiowa
3A Latimer
3A Le Flore
3A Lincoln
3A Logan
3A Love
4A Major
3A Marshall
3A Mayes
3A McClain
3A McCurtain
3A McIntosh
3A Murray
3A Muskogee
3A Noble
4A Nowata
3A Okfuskee
3A Oklahoma
3A Okmulgee
4A Osage
4A Ottawa
3A Pawnee
3A Payne
3A Pittsburg
3A Pontotoc

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
OKLAHOMA *(continued)*
3A Pottawatomie
3A Pushmataha
3A Roger Mills
3A Rogers
3A Seminole
3A Sequoyah
3A Stephens
4B Texas
3A Tillman
3A Tulsa
3A Wagoner
4A Washington
3A Washita
4A Woods
4A Woodward
OREGON
5B Baker
4C Benton
4C Clackamas
4C Clatsop
4C Columbia
4C Coos
5B Crook
4C Curry
5B Deschutes
4C Douglas
5B Gilliam
5B Grant
5B Harney
5B Hood River
4C Jackson
5B Jefferson
4C Josephine
5B Klamath
5B Lake
4C Lane
4C Lincoln
4C Linn
5B Malheur
4C Marion
5B Morrow
4C Multnomah
4C Polk
5B Sherman
4C Tillamook
5B Umatilla
5B Union
5B Wallowa
5B Wasco
4C Washington
5B Wheeler
4C Yamhill
PENNSYLVANIA
4A Adams
5A Allegheny
5A Armstrong
5A Beaver
5A Bedford
4A Berks
5A Blair
5A Bradford
4A Bucks
5A Butler
5A Cambria
5A Cameron
5A Carbon
5A Centre
4A Chester
5A Clarion
5A Clearfield
5A Clinton
5A Columbia
5A Crawford
4A Cumberland
4A Dauphin
4A Delaware
5A Elk
5A Erie
5A Fayette
5A Forest
4A Franklin
5A Fulton
5A Greene
5A Huntingdon
5A Indiana
5A Jefferson
5A Juniata
5A Lackawanna

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
PENNSYLVANIA *(continued)*
4A Lancaster
5A Lawrence
4A Lebanon
5A Lehigh
5A Luzerne
5A Lycoming
5A McKean
5A Mercer
5A Mifflin
5A Monroe
4A Montgomery
5A Montour
5A Northampton
5A Northumberland
4A Perry
4A Philadelphia
5A Pike
5A Potter
5A Schuylkill
5A Snyder
5A Somerset
5A Sullivan
5A Susquehanna
5A Tioga
5A Union
5A Venango
5A Warren
5A Washington
5A Wayne
5A Westmoreland
5A Wyoming
4A York
RHODE ISLAND
5A (all)
SOUTH CAROLINA
3A Abbeville
3A Aiken
3A Allendale*
3A Anderson
3A Bamberg*
3A Barnwell*
2A Beaufort*
3A Berkeley*
3A Calhoun
3A Charleston*
3A Cherokee
3A Chester
3A Chesterfield
3A Clarendon
3A Colleton*
3A Darlington
3A Dillon
3A Dorchester*
3A Edgefield
3A Fairfield
3A Florence
3A Georgetown*
3A Greenville
3A Greenwood
3A Hampton*
3A Horry*
2A Jasper*
3A Kershaw
3A Lancaster
3A Laurens
3A Lee
3A Lexington
3A Marion
3A Marlboro
3A McCormick
3A Newberry
3A Oconee
3A Orangeburg
3A Pickens
3A Richland
3A Saluda
3A Spartanburg
3A Sumter
3A Union
3A Williamsburg
3A York
SOUTH DAKOTA
6A Aurora
6A Beadle
5A Bennett
5A Bon Homme
6A Brookings
6A Brown

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
SOUTH DAKOTA *(continued)*
5A Brule
6A Buffalo
6A Butte
6A Campbell
5A Charles Mix
6A Clark
5A Clay
6A Codington
6A Corson
6A Custer
6A Davison
6A Day
6A Deuel
6A Dewey
5A Douglas
6A Edmunds
6A Fall River
6A Faulk
6A Grant
5A Gregory
5A Haakon
6A Hamlin
6A Hand
6A Hanson
6A Harding
6A Hughes
5A Hutchinson
6A Hyde
5A Jackson
6A Jerauld
5A Jones
6A Kingsbury
6A Lake
6A Lawrence
6A Lincoln
5A Lyman
6A Marshall
6A McCook
6A McPherson
6A Meade
5A Mellette
6A Miner
6A Minnehaha
6A Moody
6A Pennington
6A Perkins
6A Potter
6A Roberts
6A Sanborn
6A Shannon
6A Spink
5A Stanley
6A Sully
5A Todd
5A Tripp
6A Turner
5A Union
6A Walworth
5A Yankton
6A Ziebach
TENNESSEE
4A Anderson
3A Bedford
4A Benton
4A Bledsoe
4A Blount
4A Bradley
4A Campbell
4A Cannon
4A Carroll
4A Carter
4A Cheatham
3A Chester
4A Claiborne
4A Clay
4A Cocke
3A Coffee
3A Crockett
4A Cumberland
3A Davidson
3A Decatur
4A DeKalb
4A Dickson
3A Dyer
3A Fayette
4A Fentress
3A Franklin
3A Gibson

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TENNESSEE *(continued)*
3A Giles
4A Grainger
4A Greene
3A Grundy
4A Hamblen
3A Hamilton
4A Hancock
3A Hardeman
3A Hardin
4A Hawkins
3A Haywood
3A Henderson
4A Henry
3A Hickman
4A Houston
4A Humphreys
4A Jackson
4A Jefferson
4A Johnson
4A Knox
4A Lake
3A Lauderdale
3A Lawrence
3A Lewis
3A Lincoln
4A Loudon
4A Macon
3A Madison
3A Marion
3A Marshall
3A Maury
4A McMinn
3A McNairy
4A Meigs
4A Monroe
4A Montgomery
3A Moore
4A Morgan
4A Obion
4A Overton
3A Perry
4A Pickett
4A Polk
4A Putnam
4A Rhea
4A Roane
4A Robertson
3A Rutherford
4A Scott
4A Sequatchie
4A Sevier
3A Shelby
4A Smith
4A Stewart
4A Sullivan
4A Sumner
3A Tipton
4A Trousdale
4A Unicoi
4A Union
4A Van Buren
4A Warren
4A Washington
3A Wayne
4A Weakley
4A White
3A Williamson
4A Wilson
TEXAS
2A Anderson*
3B Andrews
2A Angelina*
2A Aransas*
3A Archer
4B Armstrong
2A Atascosa*
2A Austin*
4B Bailey
2B Bandera
2A Bastrop*
3B Baylor
2A Bee*
2A Bell*
2A Bexar*
3A Blanco*
3B Borden
2A Bosque*
3A Bowie*

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
2A Brazoria*
2A Brazos*
3B Brewster
4B Briscoe
2A Brooks*
3A Brown*
2A Burleson*
3A Burnet*
2A Caldwell*
2A Calhoun*
3B Callahan
1A Cameron*
3A Camp*
4B Carson
3A Cass*
4B Castro
2A Chambers*
2A Cherokee*
3B Childress
3A Clay
4B Cochran
3B Coke
3B Coleman
3A Collin*
3B Collingsworth
2A Colorado*
2A Comal*
3A Comanche*
3B Concho
3A Cooke
2A Coryell*
3B Cottle
3B Crane
3B Crockett
3B Crosby
3B Culberson
4B Dallam
2A Dallas*
3B Dawson
4B Deaf Smith
3A Delta
3A Denton*
2A DeWitt*
3B Dickens
2B Dimmit
4B Donley
2A Duval*
3A Eastland
3B Ector
2B Edwards
2A Ellis*
3B El Paso
3A Erath*
2A Falls*
3A Fannin
2A Fayette*
3B Fisher
4B Floyd
3B Foard
2A Fort Bend*
3A Franklin*
2A Freestone*
2B Frio
3B Gaines
2A Galveston*
3B Garza
3A Gillespie*
3B Glasscock
2A Goliad*
2A Gonzales*
4B Gray
3A Grayson
3A Gregg*
2A Grimes*
2A Guadalupe*
4B Hale
3B Hall
3A Hamilton*
4B Hansford
3B Hardeman
2A Hardin*
2A Harris*
3A Harrison*
4B Hartley
3B Haskell
2A Hays*
3B Hemphill
3A Henderson*

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
1A Hidalgo*
2A Hill*
4B Hockley
3A Hood*
3A Hopkins*
2A Houston*
3B Howard
3B Hudspeth
3A Hunt*
4B Hutchinson
3B Irion
3A Jack
2A Jackson*
2A Jasper*
3B Jeff Davis
2A Jefferson*
2A Jim Hogg*
2A Jim Wells*
2A Johnson*
3B Jones
2A Karnes*
3A Kaufman*
3A Kendall*
2A Kenedy*
3B Kent
3B Kerr
3B Kimble
3B King
2B Kinney
2A Kleberg*
3B Knox
3A Lamar*
4B Lamb
3A Lampasas*
2B La Salle
2A Lavaca*
2A Lee*
2A Leon*
2A Liberty*
2A Limestone*
4B Lipscomb
2A Live Oak*
3A Llano*
3B Loving
3B Lubbock
3B Lynn
2A Madison*
3A Marion*
3B Martin
3B Mason
2A Matagorda*
2B Maverick
3B McCulloch
2A McLennan*
2A McMullen*
2B Medina
3B Menard
3B Midland
2A Milam*
3A Mills*
3B Mitchell
3A Montague
2A Montgomery*
4B Moore
3A Morris*
3B Motley
3A Nacogdoches*
2A Navarro*
2A Newton*
3B Nolan
2A Nueces*
4B Ochiltree
4B Oldham
2A Orange*
3A Palo Pinto*
3A Panola*
3A Parker*
4B Parmer
3B Pecos
2A Polk*
4B Potter
3B Presidio
3A Rains*
4B Randall
3B Reagan
2B Real
3A Red River*
3B Reeves

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
TEXAS *(continued)*
2A Refugio*
4B Roberts
2A Robertson*
3A Rockwall*
3B Runnels
3A Rusk*
3A Sabine*
3A San Augustine*
2A San Jacinto*
2A San Patricio*
3A San Saba*
3B Schleicher
3B Scurry
3B Shackelford
3A Shelby*
4B Sherman
3A Smith*
3A Somervell*
2A Starr*
3A Stephens
3B Sterling
3B Stonewall
3B Sutton
4B Swisher
2A Tarrant*
3B Taylor
3B Terrell
3B Terry
3B Throckmorton
3A Titus*
3B Tom Green
2A Travis*
2A Trinity*
2A Tyler*
3A Upshur*
3B Upton
2B Uvalde
2B Val Verde
3A Van Zandt*
2A Victoria*
2A Walker*
2A Waller*
3B Ward
2A Washington*
2B Webb
2A Wharton*
3B Wheeler
3A Wichita
3B Wilbarger
1A Willacy*
2A Williamson*
2A Wilson*
3B Winkler
3A Wise
3A Wood*
4B Yoakum
3A Young
2B Zapata
2B Zavala
UTAH
5B Beaver
5B Box Elder
5B Cache
5B Carbon
6B Daggett
5B Davis
6B Duchesne
5B Emery
5B Garfield
5B Grand
5B Iron
5B Juab
5B Kane
5B Millard
6B Morgan
5B Piute
6B Rich
5B Salt Lake
5B San Juan
5B Sanpete
5B Sevier
6B Summit
5B Tooele
6B Uintah
5B Utah
6B Wasatch
3B Washington
5B Wayne

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
UTAH *(continued)*
5B Weber
VERMONT
6A (all)
VIRGINIA
4A (all except as follows:)
5A Alleghany
5A Bath
3A Brunswick
3A Chesapeake
5A Clifton Forge
5A Covington
3A Emporia
3A Franklin
3A Greensville
3A Halifax
3A Hampton
5A Highland
3A Isle of Wight
3A Mecklenburg
3A Newport News
3A Norfolk
3A Pittsylvania
3A Portsmouth
3A South Boston
3A Southampton
3A Suffolk
3A Surry
3A Sussex
3A Virginia Beach
WASHINGTON
5B Adams
5B Asotin
5B Benton
5B Chelan
5C Clallam
4C Clark
5B Columbia
4C Cowlitz
5B Douglas
6B Ferry
5B Franklin
5B Garfield
5B Grant
4C Grays Harbor
5C Island
4C Jefferson
4C King
5C Kitsap
5B Kittitas
5B Klickitat
4C Lewis
5B Lincoln
4C Mason
5B Okanogan
4C Pacific
6B Pend Oreille
4C Pierce
5C San Juan
4C Skagit
5B Skamania
4C Snohomish
5B Spokane
6B Stevens
4C Thurston
4C Wahkiakum
5B Walla Walla
4C Whatcom
5B Whitman
5B Yakima
WEST VIRGINIA
5A Barbour
4A Berkeley
4A Boone
4A Braxton
5A Brooke
4A Cabell
4A Calhoun
4A Clay
4A Doddridge
4A Fayette
4A Gilmer
5A Grant
4A Greenbrier
5A Hampshire
5A Hancock
5A Hardy
5A Harrison
4A Jackson

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
WEST VIRGINIA *(continued)*
4A Jefferson
4A Kanawha
4A Lewis
4A Lincoln
4A Logan
5A Marion
5A Marshall
4A Mason
4A McDowell
4A Mercer
5A Mineral
4A Mingo
5A Monongalia
4A Monroe
4A Morgan
4A Nicholas
5A Ohio
5A Pendleton
4A Pleasants
5A Pocahontas
5A Preston
4A Putnam
4A Raleigh
5A Randolph
4A Ritchie
4A Roane
4A Summers
5A Taylor
5A Tucker
4A Tyler
4A Upshur
4A Wayne
4A Webster
5A Wetzel
4A Wirt
4A Wood
4A Wyoming
WISCONSIN
5A Adams
6A Ashland
6A Barron
6A Bayfield
6A Brown
6A Buffalo
6A Burnett
5A Calumet
6A Chippewa
6A Clark
5A Columbia
5A Crawford
5A Dane
5A Dodge
6A Door
6A Douglas
6A Dunn
6A Eau Claire
6A Florence
5A Fond du Lac
6A Forest
5A Grant
5A Green
5A Green Lake
5A Iowa
6A Iron
6A Jackson
5A Jefferson
5A Juneau
5A Kenosha
6A Kewaunee
5A La Crosse
5A Lafayette
6A Langlade
6A Lincoln
6A Manitowoc
6A Marathon
6A Marinette
6A Marquette
6A Menominee
5A Milwaukee
5A Monroe
6A Oconto
6A Oneida
5A Outagamie
5A Ozaukee
6A Pepin
6A Pierce
6A Polk
6A Portage

(continued)

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TABLE R301.1—continued
CLIMATE ZONES, MOISTURE REGIMES, AND WARM HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY[a]

US STATES—continued
WISCONSIN *(continued)*
6A Price
5A Racine
5A Richland
5A Rock
6A Rusk
5A Sauk
6A Sawyer
6A Shawano
6A Sheboygan
6A St. Croix
6A Taylor
6A Trempealeau
5A Vernon
6A Vilas
5A Walworth
6A Washburn
5A Washington
5A Waukesha
6A Waupaca
5A Waushara
5A Winnebago
6A Wood
WYOMING
6B Albany
6B Big Horn
6B Campbell
6B Carbon
6B Converse
6B Crook
6B Fremont
5B Goshen
6B Hot Springs
6B Johnson
5B Laramie
7 Lincoln
6B Natrona
6B Niobrara
6B Park
5B Platte
6B Sheridan
7 Sublette
6B Sweetwater
7 Teton
6B Uinta
6B Washakie
6B Weston
US TERRITORIES
AMERICAN SAMOA
1A (all)*
GUAM
1A (all)*
NORTHERN MARIANA ISLANDS
1A (all)*
PUERTO RICO
1A (all except as follows:)*
2B Barraquitas
2B Cayey
VIRGIN ISLANDS
1A (all)*

a. Key: A – Moist, B – Dry, C – Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a Warm Humid location.

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R301.3 Climate zone definitions. To determine the climate zones for locations not listed in this code, use the following information to determine climate zone numbers and letters in accordance with Items 1 through 5.

1. Determine the thermal climate zone, 0 through 8, from Table R301.3 using the heating (HDD) and cooling degree-days (CDD) for the location.
2. Determine the moisture zone (Marine, Dry or Humid) in accordance with Items 2.1 through 2.3.
    2.1. If monthly average temperature and precipitation data are available, use the Marine, Dry and Humid definitions to determine the moisture zone (C, B or A).
    2.2. If annual average temperature information (including degree-days) and annual precipitation (i.e., annual mean) are available, use Items 2.2.1 through 2.2.3 to determine the moisture zone. If the moisture zone is not Marine, then use the Dry definition to determine whether Dry or Humid.
        2.2.1. If thermal climate zone is 3 and CDD50°F ≤ 4,500 (CDD10°C ≤ 2500), climate zone is Marine (3C).
        2.2.2. If thermal climate zone is 4 and CDD50°F ≤ 2,700 (CDD10°C ≤ 1500), climate zone is Marine (4C).
        2.2.3. If thermal climate zone is 5 and CDD50°F ≤ 1,800 (CDD10°C ≤ 1000), climate zone is Marine (5C).
    2.3. If only degree-day information is available, use Items 2.3.1 through 2.3.3 to determine the moisture zone. If the moisture zone is not Marine, then it is not possible to assign Humid or Dry moisture zone for this location.
        2.3.1. If thermal climate zone is 3 and CDD50°F ≤ 4,500 (CDD10°C ≤ 2500), climate zone is Marine (3C).
        2.3.2. If thermal climate zone is 4 and CDD50°F ≤ 2,700 (CDD10°C ≤ 1500), climate zone is Marine (4C).
        2.3.3. If thermal climate zone is 5 and CDD50°F ≤ 1,800 (CDD10°C ≤ 1000), climate zone is Marine (5C).
3. Marine (C) Zone definition: Locations meeting all the criteria in Items 3.1 through 3.4.
    3.1. Mean temperature of coldest month between 27°F (-3°C) and 65°F (18°C).
    3.2. Warmest month mean < 72°F (22°C).
    3.3. Not fewer than four months with mean temperatures over 50°F (10°C).
    3.4. Dry season in summer. The month with the heaviest precipitation in the cold season has at least three times as much precipitation as the month with the least precipitation in the rest of the year. The cold season is October through March in the Northern Hemisphere and April through September in the Southern Hemisphere.
4. Dry (B) definition: Locations meeting the criteria in Items 4.1 through 4.4.
    4.1. Not Marine (C).
    4.2. If 70 percent or more of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-1.

    $$P < 0.44 \times (T - 7)$$
    $$[P < 20.0 \times (T + 14) \text{ in SI units}]$$
    (Equation 3-1)

    where:
    P = Annual precipitation, inches (mm).
    T = Annual mean temperature, °F (°C).

    4.3. If between 30 and 70 percent of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-2.

    $$P < 0.44 \times (T - 19.5)$$
    $$[P < 20.0 \times (T + 7) \text{ in SI units}]$$
    (Equation 3-2)

    where:
    P = Annual precipitation, inches (mm).
    T = Annual mean temperature, °F (°C).

    4.4. If 30 percent or less of the precipitation, P, occurs during the high sun period, defined as April through September in the Northern Hemisphere and October through March in the Southern Hemisphere, then the dry/humid threshold is in accordance with Equation 3-3.

    $$P < 0.44 \times (T - 32)$$
    $$[P < 20.0 \times T \text{ in SI units}]$$
    (Equation 3-3)

    where:
    P = Annual precipitation, inches (mm).
    T = Annual mean temperature, °F (°C).
5. Humid (A) definition: Locations that are not Marine (C) or Dry (B).

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TABLE R301.3
THERMAL CLIMATE ZONE DEFINITIONS

ZONE NUMBER	THERMAL CRITERIA	
	IP Units	SI Units
0	10,800 < CDD50°F	6000 < CDD10°C
1	9,000 < CDD50°F < 10,800	5000 < CDD10°C < 6000
2	6,300 < CDD50°F ≤ 9,000	3500 < CDD10°C ≤ 5000
3	CDD50°F ≤ 6,300 AND HDD65°F ≤ 3,600	CDD10°C < 3500 AND HDD18°C ≤ 2000
4	CDD50°F ≤ 6,300 AND 3,600 < HDD65°F ≤ 5,400	CDD10°C < 3500 AND 2000 < HDD18°C ≤ 3000
5	CDD50°F < 6,300 AND 5,400 < HDD65°F ≤ 7,200	CDD10°C < 3500 AND 3000 < HDD18°C ≤ 4000
6	7,200 < HDD65°F ≤ 9,000	4000 < HDD18°C ≤ 5000
7	9,000 < HDD65°F ≤ 12,600	5000 < HDD18°C ≤ 7000
8	12,600 < HDD65°F	7000 < HDD18°C

For SI: °C = [(°F) - 32]/1.8.

R301.4 Tropical climate region. The tropical region shall be defined as:

1. Hawaii, Puerto Rico, Guam, American Samoa, U.S. Virgin Islands, Commonwealth of Northern Mariana Islands; and
2. Islands in the area between the Tropic of Cancer and the Tropic of Capricorn.

SECTION R302
DESIGN CONDITIONS

R302.1 Interior design conditions. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.

SECTION R303
MATERIALS, SYSTEMS AND EQUIPMENT

R303.1 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

R303.1.1 Building thermal envelope insulation. An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation that is 12 inches (305 mm) or greater in width. Alternatively, the insulation installers shall provide a certification that indicates the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown-in or sprayed fiberglass and cellulose insulation, the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be indicated on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and the *R*-value of the installed thickness shall be indicated on the certification. For insulated siding, the *R*-value shall be on a label on the product's package and shall be indicated on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

Exception: For roof insulation installed above the deck, the *R*-value shall be labeled as required by the material standards specified in Table 1508.2 of the *International Building Code* or Table R906.2 of the *International Residential Code*, as applicable.

R303.1.1.1 Blown-in or sprayed roof and ceiling insulation. The thickness of blown-in or sprayed fiberglass and cellulose roof and ceiling insulation shall be written in inches (mm) on markers that are installed at not less than one for every 300 square feet (28 m^2) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers not less than 1 inch (25 mm) in height. Each marker shall face the attic access opening. The thickness and installed *R*-value of sprayed polyurethane foam insulation shall be indicated on the certification provided by the insulation installer.

R303.1.2 Insulation mark installation. Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable at inspection. For insulation materials that are installed without an observable manufacturer's *R*-value mark, such as blown or draped products, an insulation certificate complying with Section R303.1.1 shall be left immediately after installation by the installer, in a conspicuous location within the building, to certify the installed *R*-value of the insulation material.

R303.1.3 Fenestration product rating. *U*-factors of fenestration products such as windows, doors and *skylights* shall be determined in accordance with NFRC 100.

Exception: Where required, garage door *U*-factors shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

U-factors shall be determined by an accredited, independent laboratory, and labeled and certified by the manufacturer.

Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Table R303.1.3(1) or Table R303.1.3(2). The *solar heat gain coefficient* (SHGC) and *visible transmittance* (VT) of glazed fenestration products such as windows, glazed doors and *skylights* shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC or VT shall be assigned a default SHGC or VT from Table R303.1.3(3).

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TABLE R303.1.3(1)
DEFAULT GLAZED WINDOW, GLASS DOOR AND SKYLIGHT *U*-FACTORS

FRAME TYPE	WINDOW AND GLASS DOOR		SKYLIGHT	
	Single pane	Double pane	Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

TABLE R303.1.3(2)
DEFAULT OPAQUE DOOR *U*-FACTORS

DOOR TYPE	OPAQUE *U*-FACTOR
Uninsulated Metal	1.20
Insulated Metal	0.60
Wood	0.50
Insulated, nonmetal edge, not exceeding 45% glazing, any glazing double pane	0.35

TABLE R303.1.3(3)
DEFAULT GLAZED FENESTRATION SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

R303.1.4 Insulation product rating. The thermal resistance, *R*-value, of insulation shall be determined in accordance with Part 460 of US-FTC CFR Title 16 in units of h × ft^2 × °F/Btu at a mean temperature of 75°F (24°C).

R303.1.4.1 Insulated siding. The thermal resistance, *R*-value, of insulated siding shall be determined in accordance with ASTM C1363. Installation for testing shall be in accordance with the manufacturer's instructions.

R303.1.5 Air-impermeable insulation. Insulation having an air permeability not greater than 0.004 cubic feet per minute per square foot [0.002 L/(s × m^2)] under pressure differential of 0.3 inch water gauge (75 Pa) when tested in accordance with ASTM E2178 shall be determined air-impermeable insulation.

R303.2 Installation. Materials, systems and equipment shall be installed in accordance with the manufacturer's instructions and the *International Building Code* or the *International Residential Code*, as applicable.

R303.2.1 Protection of exposed foundation insulation. Insulation applied to the exterior of *basement walls*, crawl space walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend not less than 6 inches (153 mm) below grade.

R303.3 Maintenance information. Maintenance instructions shall be furnished for equipment and systems that require preventive maintenance. Required regular maintenance actions shall be clearly stated and incorporated on a readily visible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.

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CHAPTER 4 [RE]
RESIDENTIAL ENERGY EFFICIENCY

User note:

About this chapter: *Chapter 4 presents the paths and options for compliance with the energy efficiency provisions. Chapter 4 contains energy efficiency provisions for the building envelope, mechanical and water heating systems, lighting and additional efficiency requirements. A performance alternative, energy rating alternative, and tropical regional alternative are also provided to allow for energy code compliance other than by the prescriptive method.*

SECTION R401
GENERAL

R401.1 Scope. This chapter applies to residential buildings.

R401.2 Application. Residential buildings shall comply with Section R401.2.5 and either Sections R401.2.1, R401.2.2, R401.2.3 or R401.2.4.

Exception: Additions, *alterations*, repairs and changes of occupancy to existing buildings complying with Chapter 5.

R401.2.1 Prescriptive Compliance Option. The Prescriptive Compliance Option requires compliance with Sections R401 through R404.

R401.2.2 Total Building Performance Option. The Total Building Performance Option requires compliance with Section R405.

R401.2.3 Energy Rating Index Option. The Energy Rating Index (ERI) Option requires compliance with Section R406.

R401.2.4 Tropical Climate Region Option. The Tropical Climate Region Option requires compliance with Section R407.

R401.2.5 Additional energy efficiency. This section establishes additional requirements applicable to all compliance approaches to achieve additional energy efficiency.

1. For buildings complying with Section R401.2.1, one of the additional efficiency package options shall be installed according to Section R408.2.
2. For buildings complying with Section R401.2.2, the building shall meet one of the following:
   2.1. One of the additional efficiency package options in Section R408.2 shall be installed without including such measures in the proposed design under Section R405; or
   2.2. The proposed design of the building under Section R405.2 shall have an annual energy cost that is less than or equal to 95 percent of the annual energy cost of the standard reference design.
3. For buildings complying with the Energy Rating Index alternative Section R401.2.3, the Energy Rating Index value shall be at least 5 percent less than the Energy Rating Index target specified in Table R406.5.

The option selected for compliance shall be identified in the certificate required by Section R401.3. *

R401.3 Certificate. A permanent certificate shall be completed by the builder or other *approved* party and posted on a wall in the space where the furnace is located, a utility room or an *approved* location inside the *building*. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory *label*, service disconnect *label* or other required labels. The certificate shall indicate the following:

1. The predominant *R*-values of insulation installed in or on ceilings, roofs, walls, foundation components such as slabs, *basement walls*, *crawl space walls* and floors and ducts outside *conditioned spaces.*
2. *U*-factors of fenestration and the *solar heat gain coefficient* (SHGC) of fenestration. Where there is more than one value for any component of the building envelope, the certificate shall indicate both the value covering the largest area and the area weighted average value if available.
3. The results from any required duct system and building envelope air leakage testing performed on the building.
4. The types, sizes and efficiencies of heating, cooling and service water-heating equipment. Where a gas-fired unvented room heater, electric furnace or baseboard electric heater is installed in the residence, the certificate shall indicate “gas-fired unvented room heater,” “electric furnace” or “baseboard electric heater,” as appropriate. An efficiency shall not be indicated for gas-fired unvented room heaters, electric furnaces and electric baseboard heaters.
5. Where on-site *photovoltaic panel* systems have been installed, the array capacity, inverter efficiency, panel tilt and orientation shall be noted on the certificate.
6. For buildings where an Energy Rating Index score is determined in accordance with Section R406, the Energy Rating Index score, both with and without

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any on-site generation, shall be listed on the certificate.

7. The code edition under which the structure was permitted, and the compliance path used.

SECTION R402
BUILDING THERMAL ENVELOPE

R402.1 General. The *building thermal envelope* shall comply with the requirements of Sections R402.1.1 through R402.1.5.

Exceptions:

1. The following low-energy *buildings*, or portions thereof, separated from the remainder of the building by *building thermal envelope* assemblies complying with this section shall be exempt from the *building thermal envelope* provisions of Section R402.
   1.1. Those with a peak design rate of energy usage less than 3.4 Btu/h × ft^2 (10.7 W/m^2) or 1.0 watt/ft^2 of floor area for space-conditioning purposes.
   1.2. Those that do not contain *conditioned space*.
2. Log homes designed in accordance with ICC 400.

R402.1.1 Vapor retarder. Wall assemblies in the *building thermal envelope* shall comply with the vapor retarder requirements of Section R702.7 of the *International Residential Code* or Section 1404.3 of the *International Building Code*, as applicable.

R402.1.2 Insulation and fenestration criteria. The *building thermal envelope* shall meet the requirements of Table R402.1.2, based on the *climate zone* specified in Chapter 3. Assemblies shall have a *U*-factor equal to or less than that specified in Table R402.1.2. Fenestration shall have a *U*-factor and glazed fenestration SHGC equal to or less than that specified in Table R402.1.2.

R402.1.3 *R*-value alternative. Assemblies with *R*-value of insulation materials equal to or greater than that specified in Table R402.1.3 shall be an alternative to the *U*-factor in Table R402.1.2

R402.1.4 *R*-value computation. Cavity insulation alone shall be used to determine compliance with the cavity insulation *R*-value requirements in Table R402.1.3. Where cavity insulation is installed in multiple layers, the *R*-values of the cavity insulation layers shall be summed to determine compliance with the cavity insulation *R*-value requirements. The manufacturer's settled *R*-value shall be used for blown-in insulation. Continuous insulation (ci) alone shall be used to determine compliance with the continuous insulation *R*-value requirements in Table R402.1.3. Where continuous insulation is installed in multiple layers, the *R*-values of the continuous insulation layers shall be summed to determine compliance with the continuous insulation *R*-value requirements. Cavity insulation *R*-values shall not be used to determine compliance with the continuous insulation *R*-value requirements in Table R402.1.3. Computed *R*-values shall not include an

TABLE R402.1.2
MAXIMUM ASSEMBLY *U*-FACTORS[a] AND FENESTRATION REQUIREMENTS

CLIMATE ZONE	FENESTRATION *U*-FACTOR[f]	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC[d, e]	CEILING *U*-FACTOR	WOOD FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
0	0.50	0.75	0.25	0.035	0.084	0.197	0.064	0.360	0.477
1	0.50	0.75	0.25	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.25	0.026	0.084	0.165	0.064	0.360	0.477
3	0.30	0.55	0.25	0.026	0.060	0.098	0.047	0.091[c]	0.136
4 except Marine	0.30	0.55	0.40	0.024	0.045	0.098	0.047	0.059	0.065
5 and Marine 4	0.30	0.55	0.40	0.024	0.045	0.082	0.033	0.050	0.055
6	0.30	0.55	NR	0.024	0.045	0.060	0.033	0.050	0.055
7 and 8	0.30	0.55	NR	0.024	0.045	0.057	0.028	0.050	0.055

For SI: 1 foot = 304.8 mm.

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.

b. Mass walls shall be in accordance with Section R402.2.5. Where more than half the insulation is on the interior, the mass wall *U*-factors shall not exceed 0.17 in Climate Zones 0 and 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.087 in Climate Zone 4 except Marine, 0.065 in Climate Zone 5 and Marine 4, and 0.057 in Climate Zones 6 through 8.

c. In Warm Humid locations as defined by Figure R301.1 and Table R301.1, the basement wall *U*-factor shall not exceed 0.360.

d. The SHGC column applies to all glazed fenestration.
Exception: In Climate Zones 0 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.

e. There are no SHGC requirements in the Marine Zone.

f. A maximum *U*-factor of 0.32 shall apply in Marine Climate Zone 4 and Climate Zones 5 through 8 to vertical fenestration products installed in buildings located either:
1. Above 4,000 feet in elevation above sea level, or
2. In windborne debris regions where protection of openings is required by Section R301.2.1.2 of the *International Residential Code*.

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TABLE R402.1.3
INSULATION MINIMUM *R*-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b, i]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE[g]	MASS WALL *R*-VALUE[h]	FLOOR *R*-VALUE	BASEMENT[c,g] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c,g] WALL *R*-VALUE
0	NR	0.75	0.25	30	13 or 0&10ci	3/4	13	0	0	0
1	NR	0.75	0.25	30	13 or 0&10ci	3/4	13	0	0	0
2	0.40	0.65	0.25	49	13 or 0&10ci	4/6	13	0	0	0
3	.30	0.55	0.25	49	20 or 13&5ci[h] or 0&15ci[h]	8/13	19	5ci or 13[f]	10ci, 2 ft	5ci or 13[f]
4 except Marine	.30	0.55	0.40	60	30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]	8/13	19	10ci or 13	10ci, 4 ft	10ci or 13
5 and Marine 4	0.30[i]	0.55	0.40	60	30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]	13/17	30	15ci or 19 or 13&5ci	10ci, 4 ft	15ci or 19 or 13&5ci
6	0.30[i]	0.55	NR	60	30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]	15/20	30	15ci or 19 or 13&5ci	10ci, 4 ft	15ci or 19 or 13&5ci
7 and 8	0.30[i]	0.55	NR	60	30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]	19/21	38	15ci or 19 or 13&5ci	10ci, 4 ft	15ci or 19 or 13&5ci

For SI: 1 foot = 304.8 mm.
NR = Not Required.

ci = continuous insulation.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed *R*-value of the insulation shall be not less than the *R*-value specified in the table.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
Exception: In Climate Zones 0 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.

c. "5ci or 13" means R-5 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "10ci or 13" means R-10 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "15ci or 19 or 13&5ci" means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation on the interior side of the wall; or R-13 cavity insulation on the interior of the wall in addition to R-5 continuous insulation on the interior or exterior surface of the wall.

d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation *R*-value for slabs. as indicated in the table. The slab-edge insulation for heated slabs shall not be required to extend below the slab.

e. There are no SHGC requirements in the Marine Zone.

f. Basement wall insulation is not required in Warm Humid locations as defined by Figure R301.1 and Table R301.1.

g. The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, "13&5" means R-13 cavity insulation plus R-5 continuous insulation.

h. Mass walls shall be in accordance with Section R402.2.5. The second *R*-value applies where more than half of the insulation is on the interior of the mass wall.

i. A maximum *U*-factor of 0.32 shall apply in Climate Zones 3 through 8 to vertical fenestration products installed in buildings located either:
1. Above 4,000 feet in elevation, or
2. In windborne debris regions where protection of openings is required by Section R301.2.1.2 of the *International Residential Code*.

R-value for other building materials or air films. Where insulated siding is used for the purpose of complying with the continuous insulation requirements of Table R402.1.3, the manufacturer's labeled *R*-value for the insulated siding shall be reduced by R-0.6.

R402.1.5 Total UA alternative. Where the total *building thermal envelope* UA, the sum of *U*-factor times assembly area, is less than or equal to the total UA resulting from multiplying the *U*-factors in Table R402.1.2 by the same assembly area as in the proposed *building*, the *building* shall be considered to be in compliance with Table R402.1.2. The UA calculation shall be performed using a method consistent with the ASHRAE *Handbook of Fundamentals* and shall include the thermal bridging effects of framing materials. In addition to UA compliance, the

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SHGC requirements of Table R402.1.2 and the maximum fenestration *U*-factors of Section R402.5 shall be met.

R402.2 Specific insulation requirements. In addition to the requirements of Section R402.1, insulation shall meet the specific requirements of Sections R402.2.1 through R402.2.12.

R402.2.1 Ceilings with attics. Where Section R402.1.3 requires R-49 insulation in the ceiling or attic, installing R-38 over 100 percent of the ceiling or attic area requiring insulation shall satisfy the requirement for R-49 insulation wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. Where Section R402.1.3 requires R-60 insulation in the ceiling or attic, installing R-49 over 100 percent of the ceiling or attic area requiring insulation shall satisfy the requirement for R-60 insulation wherever the full height of uncompressed R-49 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the insulation and fenestration criteria in Section R402.1.2 and the Total UA alternative in Section R402.1.5.

R402.2.2 Ceilings without attics. Where Section R402.1.3 requires insulation *R*-values greater than R-30 in the interstitial space above a ceiling and below the structural roof deck, and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation *R*-value for such roof/ceiling assemblies shall be R-30. Insulation shall extend over the top of the wall plate to the outer edge of such plate and shall not be compressed. This reduction of insulation from the requirements of Section R402.1.3 shall be limited to 500 square feet (46 m^2) or 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the Total UA alternative in Section R402.1.5.

R402.2.3 Eave baffle. For air-permeable insulation in vented attics, a baffle shall be installed adjacent to soffit and eave vents. Baffles shall maintain a net free area opening equal to or greater than the size of the vent. The baffle shall extend over the top of the attic insulation. The baffle shall be permitted to be any solid material. The baffle shall be installed to the outer edge of the *exterior wall* top plate so as to provide maximum space for attic insulation coverage over the top plate. Where soffit venting is not continuous, baffles shall be installed continuously to prevent ventilation air in the eave soffit from bypassing the baffle.

R402.2.4 Access hatches and doors. Access hatches and doors from conditioned to unconditioned spaces such as attics and crawl spaces shall be insulated to the same *R*-value required by Table R402.1.3 for the wall or ceiling in which they are installed.

Exceptions:

1. Vertical doors providing access from conditioned spaces to unconditioned spaces that comply with the fenestration requirements of Table R402.1.3 based on the applicable climate zone specified in Chapter 3.
2. Horizontal pull-down, stair-type access hatches in ceiling assemblies that provide access from conditioned to unconditioned spaces in Climate Zones 0 through 4 shall not be required to comply with the insulation level of the surrounding surfaces provided the hatch meets all of the following:
   2.1. The average *U*-factor of the hatch shall be less than or equal to U-0.10 or have an average insulation *R*-value of R-10 or greater.
   2.2. Not less than 75 percent of the panel area shall have an insulation *R*-value of R-13 or greater.
   2.3. The net area of the framed opening shall be less than or equal to 13.5 square feet (1.25 m^2).
   2.4. The perimeter of the hatch edge shall be weatherstripped.

The reduction shall not apply to the total UA alternative in Section R402.1.5.

R402.2.4.1 Access hatches and door insulation installation and retention. Vertical or horizontal access hatches and doors from *conditioned spaces* to *unconditioned spaces* such as attics and crawl spaces shall be weatherstripped. Access that prevents damaging or compressing the insulation shall be provided to all equipment. Where loose-fill insulation is installed, a wood-framed or equivalent baffle, retainer, or dam shall be installed to prevent loose-fill insulation from spilling into living space from higher to lower sections of the attic and from attics covering conditioned spaces to unconditioned spaces. The baffle or retainer shall provide a permanent means of maintaining the installed *R*-value of the loose-fill insulation.

R402.2.5 Mass walls. Mass walls where used as a component of the *building thermal envelope* shall be one of the following:

1. Above-ground walls of concrete block, concrete, insulated concrete form, masonry cavity, brick but not brick veneer, adobe, compressed earth block, rammed earth, solid timber, mass timber or solid logs.
2. Any wall having a heat capacity greater than or equal to 6 Btu/ft^2 × °F (123 kJ/m^2 × K).

R402.2.6 Steel-frame ceilings, walls and floors. Steel-frame ceilings, walls, and floors shall comply with the insulation requirements of Table R402.2.6 or the *U*-factor requirements of Table R402.1.2. The calculation of the *U*-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method.

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TABLE R402.2.6
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION *R*-VALUES

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL-FRAME EQUIVALENT *R*-VALUE[a]
Steel Truss Ceilings[b]	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
Steel Joist Ceilings[b]	
R-30	R-38 in 2 × 4 or 2 × 6 or 2 × 8 R-49 in any framing
R-38	R-49 in 2 × 4 or 2 × 6 or 2 × 8 or 2 × 10
Steel-frame Wall, 16 inches on center	
R-13	R-13 + 4.2 or R-21 + 2.8 or R-0 + 9.3 or R-15 + 3.8 or R-21 + 3.1
R-13 + 5	R-0 + 15 or R-13 + 9 or R-15 + 8.5 or R-19 + 8 or R-21 + 7
R-13 + 10	R-0 + 20 or R-13 + 15 or R-15 + 14 or R-19 + 13 or R-21 + 13
R-20	R-0 + 14.0 or R-13 + 8.9 or R-15 + 8.5 or R-19 + 7.8 or R-21 + 7.5
R-20 + 5	R-13 + 12.7 or R-15 + 12.3 or R-19 + 11.6 or R-21 + 11.3 or R-25 + 10.9
R-21	R-0 + 14.6 or R-13 + 9.5 or R-15 + 9.1 or R-19 + 8.4 or R-21 + 8.1 or R-25 + 7.7
Steel-frame Wall, 24 inches on center	
R-13	R-0 + 9.3 or R-13 + 3.0 or R-15 + 2.4
R-13 + 5	R-0 + 15 or R-13 + 7.5 or R-15 + 7 or R-19 + 6 or R-21 + 6
R-13 + 10	R-0 + 20 or R-13 + 13 or R-15 + 12 or R-19 + 11 or R-21 + 11
R-20	R-0 + 14.0 or R-13 + 7.7 or R-15 + 7.1 or R-19 + 6.3 or R-21 + 5.9
R-20 + 5	R-13 + 11.5 or R-15 + 10.9 or R-19 + 10.1 or R-21 + 9.7 or R-25 + 9.1
R-21	R-0 + 14.6 or R-13 + 8.3 or R-15 + 7.7 or R-19 + 6.9 or R-21 + 6.5 or R-25 + 5.9
Steel Joist Floor	
R-13	R-19 in 2 × 6, or R-19 + 6 in 2 × 8 or 2 × 10
R-19	R-19 + 6 in 2 × 6, or R-19 + 12 in 2 × 8 or 2 × 10

a. The first value is cavity insulation *R*-value; the second value is continuous insulation *R*-value. Therefore, for example, "R-30 + 3" means R-30 cavity insulation plus R-3 continuous insulation.

b. Insulation exceeding the height of the framing shall cover the framing.

R402.2.7 Floors. Floor *cavity insulation* shall comply with one of the following:

1. Installation shall be installed to maintain permanent contact with the underside of the subfloor decking in accordance with manufacturer instructions to maintain required *R*-value or readily fill the available cavity space.
2. Floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing separating the cavity and the unconditioned space below. Insulation shall extend from the bottom to the top of all perimeter floor framing members and the framing members shall be air sealed.
3. A combination of cavity and continuous insulation shall be installed so that the cavity insulation is in contact with the top side of the continuous insulation that is installed on the underside of the floor framing separating the cavity and the unconditioned space below. The combined *R*-value of the cavity and continuous insulation shall equal the required *R*-value for floors. Insulation shall extend from the bottom to the top of all perimeter floor framing members and the framing members shall be air sealed.

R402.2.8 Basement walls. Basement walls shall be insulated in accordance with Table R402.1.3.

Exception: Basement walls associated with unconditioned basements where all of the following requirements are met:

1. The floor overhead, including the underside stairway stringer leading to the basement, is insulated in accordance with Section R402.1.3 and applicable provisions of Sections R402.2 and R402.2.7.
2. There are no uninsulated duct, domestic hot water, or hydronic heating surfaces exposed to the basement.
3. There are no HVAC supply or return diffusers serving the basement.
4. The walls surrounding the stairway and adjacent to conditioned space are insulated in accordance with Section R402.1.3 and applicable provisions of Section R402.2.
5. The door(s) leading to the basement from conditioned spaces are insulated in accordance with Section R402.1.3 and applicable provisions of Section R402.2, and weatherstripped in accordance with Section R402.4.
6. The building thermal envelope separating the basement from adjacent conditioned spaces complies with Section R402.4.

R402.2.8.1 Basement wall insulation installation. Where *basement walls* are insulated, the insulation shall be installed from the top of the *basement wall* down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less.

R402.2.9 Slab-on-grade floors. Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table R402.1.3.

Exception: Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation.

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R402.2.9.1 Slab-on-grade floor insulation installation. Where installed, the insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table R402.1.3 or the distance of the proposed design, as applicable, by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by not less than 10 inches (254 mm) of soil. The top edge of the insulation installed between the *exterior wall* and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the *exterior wall*.

R402.2.10 Crawl space walls. Crawl space walls shall be insulated in accordance with Table R402.1.3.

Exception: Crawl space walls associated with a crawl space that is vented to the outdoors and the floor overhead is insulated in accordance with Table R402.1.3 and Section R402.2.7.

R402.2.10.1 Crawl space wall insulation installations. Where crawl space wall insulation is installed, it shall be permanently fastened to the wall and shall extend downward from the floor to the finished grade elevation and then vertically or horizontally for not less than an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder in accordance with the *International Building Code* or *International Residential Code*, as applicable. Joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend not less than 6 inches (153 mm) up stem walls and shall be attached to the stem walls.

R402.2.11 Masonry veneer. Insulation shall not be required on the horizontal portion of a foundation that supports a masonry veneer.

R402.2.12 Sunroom and heated garage insulation. *Sunrooms* enclosing *conditioned space* and heated garages shall meet the insulation requirements of this code.

Exception: For *sunrooms* and heated garages provided *thermal isolation*, and enclosed *conditioned space*, the following exceptions to the insulation requirements of this code shall apply:

1. The minimum ceiling insulation *R*-values shall be R-19 in *Climate Zones* 0 through 4 and R-24 in *Climate Zones* 5 through 8.
2. The minimum wall insulation *R*-value shall be R-13 in all *climate zones*. Walls separating a *sunroom* or heated garage with *thermal isolation* from *conditioned space* shall comply with the *building thermal envelope* requirements of this code.

R402.3 Fenestration. In addition to the requirements of Section R402, fenestration shall comply with Sections R402.3.1 through R402.3.5.

R402.3.1 *U*-factor. An area-weighted average of fenestration products shall be permitted to satisfy the *U*-factor requirements.

R402.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50-percent glazed shall be permitted to satisfy the SHGC requirements.

Dynamic glazing shall be permitted to satisfy the SHGC requirements of Table R402.1.2 provided that the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the *dynamic glazing* is automatically controlled to modulate the amount of solar gain into the space in multiple steps. *Dynamic glazing* shall be considered separately from other fenestration, and area-weighted averaging with other fenestration that is not dynamic glazing shall be prohibited.

Exception: Dynamic glazing shall not be required to comply with this section where both the lower and higher labeled SHGC comply with the requirements of Table R402.1.2.

R402.3.3 Glazed fenestration exemption. Not greater than 15 square feet (1.4 m^2) of glazed fenestration per *dwelling unit* shall be exempt from the *U*-factor and SHGC requirements in Section R402.1.2. This exemption shall not apply to the Total UA alternative in Section R402.1.5.

R402.3.4 Opaque door exemption. One side-hinged opaque door assembly not greater than 24 square feet (2.22 m^2) in area shall be exempt from the *U*-factor requirement in Section R402.1.2. This exemption shall not apply to the Total UA alternative in Section R402.1.5.

R402.3.5 Sunroom and heated garage fenestration. *Sunrooms* and heated garages enclosing *conditioned space* shall comply with the fenestration requirements of this code.

Exception: In Climate Zones 2 through 8, for *sunrooms* and heated garages with *thermal isolation* and enclosing *conditioned space*, the fenestration *U*-factor shall not exceed 0.45 and the skylight *U*-factor shall not exceed 0.70.

New fenestration separating a *sunroom* or heated garage with *thermal isolation* from *conditioned space* shall comply with the *building thermal envelope* requirements of this code.

R402.4 Air leakage. The *building thermal envelope* shall be constructed to limit air leakage in accordance with the requirements of Sections R402.4.1 through R402.4.5.

R402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections R402.4.1.1 through R402.4.1.3. The sealing methods between

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dissimilar materials shall allow for differential expansion and contraction.

R402.4.1.1 Installation. The components of the *building thermal envelope* as indicated in Table R402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria indicated in Table R402.4.1.1, as applicable to the method of construction. Where required by the *code official,* an *approved* third party shall inspect all components and verify compliance.

TABLE R402.4.1.1
AIR BARRIER, AIR SEALING AND INSULATION INSTALLATION[a]

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling or soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance, *R*-value, of not less than R-3 per inch. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between framing and skylights, and the jambs of windows and doors, shall be sealed.	—
Rim joists	Rim joists shall include an exterior air barrier.[b] The junctions of the rim board to the sill plate and the rim board and the subfloor shall be air sealed.	Rim joists shall be insulated so that the insulation maintains permanent contact with the exterior rim board.[b]
Floors, including cantilevered floors and floors above garages	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking. Alternatively, floor framing cavity insulation shall be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extending from the bottom to the top of all perimeter floor framing members.
Basement crawl space and slab foundations	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder/air barrier in accordance with Section R402.2.10. Penetrations through concrete foundation walls and slabs shall be air sealed. Class 1 vapor retarders shall not be used as an air barrier on below-grade walls and shall be installed in accordance with Section R702.7 of the *International Residential Code*.	Crawl space insulation, where provided instead of floor insulation, shall be installed in accordance with Section R402.2.10. Conditioned basement foundation wall insulation shall be installed in accordance with Section R402.2.8.1. Slab-on-grade floor insulation shall be installed in accordance with Section R402.2.10.
Shafts, penetrations	Duct and flue shafts to exterior or unconditioned space shall be sealed. Utility penetrations of the air barrier shall be caulked, gasketed or otherwise sealed and shall allow for expansion, contraction of materials and mechanical vibration.	Insulation shall be fitted tightly around utilities passing through shafts and penetrations in the building thermal envelope to maintain required *R*-value.
Narrow cavities	Narrow cavities of 1 inch or less that are not able to be insulated shall be air sealed.	Batts to be installed in narrow cavities shall be cut to fit or narrow cavities shall be filled with insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	Insulated portions of the garage separation assembly shall be installed in accordance with Sections R303 and R402.2.7.

(continued)

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TABLE R402.4.1.1—continued
AIR BARRIER, AIR SEALING AND INSULATION INSTALLATION[a]

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be air sealed in accordance with Section R402.4.5.	Recessed light fixtures installed in the building thermal envelope shall be airtight and IC rated, and shall be buried or surrounded with insulation.
Plumbing, wiring or other obstructions	All holes created by wiring, plumbing or other obstructions in the air barrier assembly shall be air sealed.	Insulation shall be installed to fill the available space and surround wiring, plumbing, or other obstructions, unless the required *R*-value can be met by installing insulation and air barrier systems completely to the exterior side of the obstructions.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate the wall from the shower or tub.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical and communication boxes. Alternatively, air-sealed boxes shall be installed.	—
HVAC register boots	HVAC supply and return register boots that penetrate building thermal envelope shall be sealed to the subfloor, wall covering or ceiling penetrated by the boot.	—
Concealed sprinklers	Where required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	—

a. Inspection of log walls shall be in accordance with the provisions of ICC 400.
b. Air barrier and insulation full enclosure is not required in unconditioned/ventilated attic spaces and at rim joists.

R402.4.1.2 Testing. The *building* or *dwelling unit* shall be tested for air leakage. The maximum air leakage rate for any *building* or *dwelling unit* under any compliance path shall not exceed 5.0 air changes per hour or 0.28 cubic feet per minute (CFM) per square foot [0.0079 $m^3/(s \times m^2)$] of dwelling unit enclosure area. Testing shall be conducted in accordance with ANSI/RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope* have been sealed.

Exception: For heated, attached private garages and heated, detached private garages accessory to one- and two-family dwellings and townhouses not more than three stories above *grade plane* in height, building envelope tightness and insulation installation shall be considered acceptable where the items in Table R402.4.1.1, applicable to the method of construction, are field verified. Where required by the code official, an *approved* third party independent from the installer shall inspect both air barrier and insulation installation criteria. Heated, attached private garage space and heated, detached private garage space shall be thermally isolated from all other habitable, *conditioned spaces* in accordance with Sections R402.2.12 and R402.3.5, as applicable.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.
3. Interior doors, where installed at the time of the test, shall be open.
4. Exterior or interior terminations for continuous ventilation systems shall be sealed.
5. Heating and cooling systems, where installed at the time of the test, shall be turned off.
6. Supply and return registers, where installed at the time of the test, shall be fully open.

Exception: When testing individual *dwelling units*, an air leakage rate not exceeding 0.30 cubic feet per minute per square foot [0.008 $m^3/(s \times m^2)$] of the dwelling unit enclosure area, tested in accordance with ANSI/RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported at a pressure of

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0.2 inch w.g. (50 Pa), shall be permitted in all climate zones for:

1. Attached single and multiple-family building *dwelling units*.
2. Buildings or *dwelling units* that are 1,500 square feet (139.4 m^2) or smaller.

Mechanical ventilation shall be provided in accordance with Section M1505 of the *International Residential Code* or Section 403.3.2 of the *International Mechanical Code*, as applicable, or with other *approved* means of ventilation.

R402.4.1.3 Leakage rate. When complying with Section R401.2.1, the building or dwelling unit shall have an air leakage rate not exceeding 5.0 air changes per hour in Climate Zones 0, 1 and 2, and 3.0 air changes per hour in Climate Zones 3 through 8, when tested in accordance with Section R402.4.1.2.

R402.4.2 Fireplaces. New wood-burning fireplaces shall have tight-fitting flue dampers or doors, and outdoor combustion air. Where using tight-fitting doors on factory-built fireplaces *listed* and *labeled* in accordance with UL 127, the doors shall be tested and *listed* for the fireplace.

R402.4.3 Fenestration air leakage. Windows, *skylights* and sliding glass doors shall have an air infiltration rate of not greater than 0.3 cfm per square foot (1.5 L/s/m^2), and for swinging doors, not greater than 0.5 cfm per square foot (2.6 L/s/m^2), when tested in accordance with NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and *listed* and *labeled* by the manufacturer.

Exception: Site-built windows, *skylights* and doors.

R402.4.4 Rooms containing fuel-burning appliances. In Climate Zones 3 through 8, where open combustion air ducts provide combustion air to open combustion fuel-burning appliances, the appliances and combustion air opening shall be located outside the *building thermal envelope* or enclosed in a room that is isolated from inside the thermal envelope. Such rooms shall be sealed and insulated in accordance with the envelope requirements of Table R402.1.3, where the walls, floors and ceilings shall meet a minimum of the *basement wall R*-value requirement. The door into the room shall be fully gasketed and any water lines and ducts in the room insulated in accordance with Section R403. The combustion air duct shall be insulated where it passes through *conditioned space* to an *R*-value of not less than R-8.

Exceptions:

1. Direct vent appliances with both intake and exhaust pipes installed continuous to the outside.
2. Fireplaces and stoves complying with Section R402.4.2 and Section R1006 of the *International Residential Code*.

R402.4.5 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be sealed to limit air leakage between conditioned and *unconditioned spaces*. Recessed luminaires shall be IC-rated and *labeled* as having an air leakage rate of not greater than 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E283 at a pressure differential of 1.57 psf (75 Pa). Recessed luminaires shall be sealed with a gasket or caulked between the housing and the interior wall or ceiling covering.

R402.4.6 Electrical and communication outlet boxes (air-sealed boxes). Electrical and communication outlet boxes installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. Electrical and communication outlet boxes shall be tested in accordance with NEMA OS 4, *Requirements for Air-Sealed Boxes for Electrical and Communication Applications*, and shall have an air leakage rate of not greater than 2.0 cubic feet per minute (0.944 L/s) at a pressure differential of 1.57 psf (75 Pa). Electrical and communication outlet boxes shall be marked "NEMA OS 4" or "OS 4" in accordance with NEMA OS 4. Electrical and communication outlet boxes shall be installed per the manufacturer's instructions and with any supplied components required to achieve compliance with NEMA OS 4.

R402.5 Maximum fenestration U-factor and SHGC. The area-weighted average maximum fenestration *U*-factor permitted using tradeoffs from Section R402.1.5 or R405 shall be 0.48 in Climate Zones 4 and 5 and 0.40 in Climate Zones 6 through 8 for vertical fenestration, and 0.75 in Climate Zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using tradeoffs from Section R405 in *Climate Zones* 0 through 3 shall be 0.40.

Exception: The maximum *U*-factor and solar heat gain coefficient (SHGC) for fenestration shall not be required in storm shelters complying with ICC 500.

SECTION R403
SYSTEMS

R403.1 Controls. Not less than one thermostat shall be provided for each separate heating and cooling system.

R403.1.1 Programmable thermostat. The thermostat controlling the primary heating or cooling system of the *dwelling unit* shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of day and different days of the week. This thermostat shall include the capability to set back or temporarily operate the system to maintain *zone* temperatures of not less than 55°F (13°C) to not greater than 85°F (29°C). The thermostat shall be programmed initially by the manufacturer with a heating temperature setpoint of not greater than 70°F (21°C) and a cooling temperature setpoint of not less than 78°F (26°C).

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R403.1.2 Heat pump supplementary heat. Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.

R403.2 Hot water boiler temperature reset. The manufacturer shall equip each gas, oil and electric boiler (other than a boiler equipped with a tankless domestic water heating coil) with automatic means of adjusting the water temperature supplied by the boiler to ensure incremental change of the inferred heat load will cause an incremental change in the temperature of the water supplied by the boiler. This can be accomplished with outdoor reset, indoor reset or water temperature sensing.

R403.3 Ducts. Ducts and air handlers shall be installed in accordance with Sections R403.3.1 through R403.3.7.

R403.3.1 Ducts located outside conditioned space. Supply and return ducts located outside *conditioned space* shall be insulated to an *R*-value of not less than R-8 for ducts 3 inches (76 mm) in diameter and larger and not less than R-6 for ducts smaller than 3 inches (76 mm) in diameter. Ducts buried beneath a building shall be insulated as required per this section or have an equivalent *thermal distribution efficiency*. Underground ducts utilizing the *thermal distribution efficiency* method shall be listed and *labeled* to indicate the *R*-value equivalency.

R403.3.2 Ducts located in conditioned space. For ductwork to be considered inside a *conditioned space,* it shall comply with one of the following:

1. The duct system shall be located completely within the *continuous air barrier* and within the building thermal envelope.
2. Ductwork in ventilated attic spaces shall be buried within ceiling insulation in accordance with Section R403.3.3 and all of the following conditions shall exist:
   2.1. The air handler is located completely within the *continuous air barrier* and within the *building thermal envelope*.
   2.2. The duct leakage, as measured either by a rough-in test of the ducts or a post-construction total system leakage test to outside the *building thermal envelope* in accordance with Section R403.3.6, is less than or equal to 1.5 cubic feet per minute (42.5 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* served by the duct system.
   2.3. The ceiling insulation *R*-value installed against and above the insulated duct is greater than or equal to the proposed ceiling insulation *R*-value, less the *R*-value of the insulation on the duct.
3. Ductwork in floor cavities located over unconditioned space shall comply with all of the following:
   3.1. A *continuous air barrier* installed between unconditioned space and the duct.
   3.2. Insulation installed in accordance with Section R402.2.7.
   3.3. A minimum R-19 insulation installed in the cavity width separating the duct from unconditioned space.
4. Ductwork located within *exterior walls* of the *building thermal envelope* shall comply with the following:
   4.1. A *continuous air barrier* installed between unconditioned space and the duct.
   4.2. Minimum R-10 insulation installed in the cavity width separating the duct from the outside sheathing.
   4.3. The remainder of the cavity insulation shall be fully insulated to the drywall side.

R403.3.3 Ducts buried within ceiling insulation. Where supply and return air ducts are partially or completely buried in ceiling insulation, such ducts shall comply with all of the following:

1. The supply and return ducts shall have an insulation *R*-value not less than R-8.
2. At all points along each duct, the sum of the ceiling insulation *R*-value against and above the top of the duct, and against and below the bottom of the duct, shall be not less than R-19, excluding the *R*-value of the duct insulation.
3. In Climate Zones 0A, 1A, 2A and 3A, the supply ducts shall be completely buried within ceiling insulation, insulated to an *R*-value of not less than R-13 and in compliance with the vapor retarder requirements of Section 604.11 of the *International Mechanical Code* or Section M1601.4.6 of the *International Residential Code*, as applicable.

   Exception: Sections of the supply duct that are less than 3 feet (914 mm) from the supply outlet shall not be required to comply with these requirements.

R403.3.3.1 Effective *R*-value of deeply buried ducts. Where using the Total Building Performance Compliance Option in accordance with Section R401.2.2, sections of ducts that are installed in accordance with Section R403.3.3, located directly on or within 5.5 inches (140 mm) of the ceiling, surrounded with blown-in attic insulation having an *R*-value of R-30 or greater and located such that the top of the duct is not less than 3.5 inches (89 mm) below the top of the insulation, shall be considered as having an effective duct insulation *R*-value of R-25.

R403.3.4 Sealing. Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with either the *International Mechanical Code* or *International Residential Code*, as applicable.

R403.3.4.1 Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage of

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not greater than 2 percent of the design airflow rate when tested in accordance with ASHRAE 193.

R403.3.5 Duct testing. Ducts shall be pressure tested in accordance with ANSI/RESNET/ICC 380 or ASTM E1554 to determine air leakage by one of the following methods:

1. Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. Registers shall be taped or otherwise sealed during the test.
2. Postconstruction test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test.

A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*.

Exception: A duct air-leakage test shall not be required for ducts serving ventilation systems that are not integrated with ducts serving heating or cooling systems.

R403.3.6 Duct leakage. The total leakage of the ducts, where measured in accordance with Section R403.3.5, shall be as follows:

1. Rough-in test: The total leakage shall be less than or equal to 4.0 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* where the air handler is installed at the time of the test. Where the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3.0 cubic feet per minute (85 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area*.
2. Postconstruction test: Total leakage shall be less than or equal to 4.0 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area*.
3. Test for ducts within thermal envelope: Where all ducts and air handlers are located entirely within the *building thermal envelope*, total leakage shall be less than or equal to 8.0 cubic feet per minute (226.6 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area*.

R403.3.7 Building cavities. *Building* framing cavities shall not be used as ducts or plenums.

R403.4 Mechanical system piping insulation. Mechanical system piping capable of carrying fluids greater than 105°F (41°C) or less than 55°F (13°C) shall be insulated to an *R*-value of not less than R-3.

R403.4.1 Protection of piping insulation. Piping insulation exposed to weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance and wind. The protection shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall be prohibited.

R403.5 Service hot water systems. Energy conservation measures for service hot water systems shall be in accordance with Sections R403.5.1 through R403.5.3.

R403.5.1 Heated water circulation and temperature maintenance systems. Heated water circulation systems shall be in accordance with Section R403.5.1.1. Heat trace temperature maintenance systems shall be in accordance with Section R403.5.1.2. Automatic controls, temperature sensors and pumps shall be in a location with access. Manual controls shall be in a location with *ready access*.

R403.5.1.1 Circulation systems. Heated water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe or a cold water supply pipe. Gravity and thermosyphon circulation systems shall be prohibited. Controls for circulating hot water system pumps shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is no demand for hot water. The controls shall limit the temperature of the water entering the cold water piping to not greater than 104ºF (40ºC).

R403.5.1.1.1 Demand recirculation water systems. Where installed, *demand recirculation water systems* shall have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance, sensing the presence of a user of a fixture or sensing the flow of hot or tempered water to a fixture fitting or appliance.

R403.5.1.2 Heat trace systems. Electric heat trace systems shall comply with IEEE 515.1 or UL 515. Controls for such systems shall automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy.

R403.5.2 Hot water pipe insulation. Insulation for service hot water piping with a thermal resistance, *R*-value, of not less than R-3 shall be applied to the following:

1. Piping $^3/_4$ inch (19.1 mm) and larger in nominal diameter located inside the *conditioned space*.
2. Piping serving more than one dwelling unit.
3. Piping located outside the *conditioned space*.
4. Piping from the water heater to a distribution manifold.
5. Piping located under a floor slab.
6. Buried piping.
7. Supply and return piping in circulation and recirculation systems other than cold water pipe return demand recirculation systems.

R403.5.3 Drain water heat recovery units. Where installed, drain water heat recovery units shall comply

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with CSA B55.2. Drain water heat recovery units shall be tested in accordance with CSA B55.1. Potable water-side pressure loss of drain water heat recovery units shall be less than 3 psi (20.7 kPa) for individual units connected to one or two showers. Potable water-side pressure loss of drain water heat recovery units shall be less than 2 psi (13.8 kPa) for individual units connected to three or more showers.

R403.6 Mechanical ventilation. The *buildings* complying with Section R402.4.1 shall be provided with ventilation that complies with the requirements of Section M1505 of the *International Residential Code* or *International Mechanical Code*, as applicable, or with other *approved* means of *ventilation*. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the *ventilation* system is not operating.

R403.6.1 Heat or energy recovery ventilation. *Dwelling units* shall be provided with a heat recovery or energy recovery ventilation system in Climate Zones 7 and 8. The system shall be balanced with a minimum sensible heat recovery efficiency of 65 percent at 32°F (0°C) at a flow greater than or equal to the design airflow.

R403.6.2 Whole-dwelling mechanical ventilation system fan efficacy. Fans used to provide whole-dwelling mechanical ventilation shall meet the efficacy requirements of Table R403.6.2 at one or more rating points. Fans shall be tested in accordance with HVI 916 and listed. The airflow shall be reported in the product listing or on the label. Fan efficacy shall be reported in the product listing or shall be derived from the input power and airflow values reported in the product listing or on the label. Fan efficacy for fully ducted HRV, ERC, balanced, and in-line fans shall be determined at a static pressure of not less than 0.2 inch w.c. (49.85 Pa). Fan efficacy for ducted range hoods, bathroom and utility room fans shall be determined at a static pressure of not less than 0.1 inch w.c. (24.91 Pa).

TABLE R403.6.2
WHOLE-DWELLING MECHANICAL VENTILATION SYSTEM FAN EFFICACY[a]

FAN LOCATION	AIRFLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)
HRV, ERV	Any	1.2 cfm/watt
In-line supply or exhaust fan	Any	3.8 cfm/watt
Other exhaust fan	< 90	2.8 cfm/watt
Other exhaust fan	≥ 90	3.5 cfm/watt
Air-handler that is integrated to tested and *listed* HVAC equipment	Any	1.2 cfm/watt

For SI: 1 cubic foot per minute = 28.3 L/min.

a. Design outdoor airflow rate/watts of fan used.

R403.6.3 Testing. Mechanical ventilation systems shall be tested and verified to provide the minimum ventilation flow rates required by Section R403.6. Testing shall be performed according to the ventilation *equipment* manufacturer's instructions, or by using a flow hood or box, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals or grilles, outlet terminals or grilles, or in the connected ventilation ducts. Where required by the code official, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.

Exception: Kitchen range hoods that are ducted to the outside with 6-inch (152 mm) or larger duct and not more than one 90-degree (1.57 rad) elbow or equivalent in the duct run.

R403.7 Equipment sizing and efficiency rating. Heating and cooling *equipment* shall be sized in accordance with ACCA Manual S based on *building* loads calculated in accordance with ACCA Manual J or other *approved* heating and cooling calculation methodologies. New or replacement heating and cooling *equipment* shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the *equipment* is installed.

R403.8 Systems serving multiple dwelling units. Systems serving multiple *dwelling units* shall comply with Sections C403 and C404 of the *International Energy Conservation Code*—Commercial Provisions instead of Section R403.

R403.9 Snow melt and ice system controls. Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is greater than 50°F (10°C) and precipitation is not falling, and an automatic or manual control that will allow shutoff when the outdoor temperature is greater than 40°F (4.8°C).

R403.10 Energy consumption of pools and spas. The energy consumption of pools and permanent spas shall be controlled by the requirements in Sections R403.10.1 through R403.10.3.

R403.10.1 Heaters. The electric power to heaters shall be controlled by an on-off switch that is an integral part of the heater mounted on the exterior of the heater in a location with *ready access*, or external to and within 3 feet (914 mm) of the heater. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously burning ignition pilots.

R403.10.2 Time switches. Time switches or other control methods that can automatically turn heaters and pump motors off and on according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Pumps that operate solar- and waste-heat-recovery pool heating systems.

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R403.10.3 Covers. Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other *approved* vapor-retardant means.

Exception: Where more than 75 percent of the energy for heating, computed over an operation season of not fewer than 3 calendar months, is from a heat pump or an on-site renewable energy system, covers or other vapor-retardant means shall not be required.

R403.11 Portable spas. The energy consumption of electric-powered portable spas shall be controlled by the requirements of APSP 14.

R403.12 Residential pools and permanent residential spas. Where installed, the energy consumption of residential swimming pools and permanent residential spas shall be controlled in accordance with the requirements of APSP 15.

SECTION R404
ELECTRICAL POWER AND LIGHTING SYSTEMS

R404.1 Lighting equipment. All permanently installed lighting fixtures, excluding kitchen appliance lighting fixtures, shall contain only high-efficacy lighting sources.

R404.1.1 Exterior lighting. Connected exterior lighting for residential buildings shall comply with Section C405.5.

Exceptions:

1. Detached one- and two- family dwellings.
2. Townhouses.
3. Solar-powered lamps not connected to any electrical service.
4. Luminaires controlled by a motion sensor.
5. Lamps and luminaires that comply with Section R404.1.

R404.1.2 Fuel gas lighting equipment. Fuel gas lighting systems shall not have continuously burning pilot lights.

R404.2 Interior lighting controls. Permanently installed lighting fixtures shall be controlled with either a dimmer, an occupant sensor control or other control that is installed or built into the fixture.

Exception: Lighting controls shall not be required for the following:

1. Bathrooms.
2. Hallways.
3. Exterior lighting fixtures.
4. Lighting designed for safety or security.

R404.3 Exterior lighting controls. Where the total permanently installed exterior lighting power is greater than 30 watts, the permanently installed exterior lighting shall comply with the following:

1. Lighting shall be controlled by a manual on and off switch which permits automatic shut-off actions.

   Exception: Lighting serving multiple *dwelling units*.

2. Lighting shall be automatically shut off when daylight is present and satisfies the lighting needs.
3. Controls that override automatic shut-off actions shall not be allowed unless the override automatically returns automatic control to its normal operation within 24 hours.

SECTION R405
TOTAL BUILDING PERFORMANCE

R405.1 Scope. This section establishes criteria for compliance using total building performance analysis. Such analysis shall include heating, cooling, mechanical ventilation and service water-heating energy only.

R405.2 Performance-based compliance. Compliance based on total building performance requires that a *proposed design* meets all of the following:

1. The requirements of the sections indicated within Table R405.2.
2. The building thermal envelope shall be greater than or equal to levels of efficiency and solar heat gain coefficients in Table R402.1.1 or R402.1.3 of the 2009 *International Energy Conservation Code*.
3. An annual energy cost that is less than or equal to the annual energy cost of the *standard reference design*. Energy prices shall be taken from a source *approved* by the *code official*, such as the Department of Energy, Energy Information Administration's State Energy Data System Prices and Expenditures reports. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.

Exception: The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.

R405.3 Documentation. Documentation of the software used for the performance design and the parameters for the *building* shall be in accordance with Sections R405.3.1 through R405.3.2.2.

R405.3.1 Compliance software tools. Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the *code official.*

R405.3.2 Compliance report. Compliance software tools shall generate a report that documents that the *proposed design* complies with Section R405.3. A compliance report on the *proposed design* shall be submitted with the application for the building permit. Upon completion of the building, a confirmed compliance report based on the confirmed condition of the building shall be submitted to the *code official* before a certificate of occupancy is issued.

Compliance reports shall include information in accordance with Sections R405.3.2.1 and R405.3.2.2.

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TABLE R405.2
REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION[a]	TITLE
General	
R401.2.5	Additional energy efficiency
R401.3	Certificate
Building Thermal Envelope	
R402.1.1	Vapor retarder
R402.2.3	Eave baffle
R402.2.4.1	Access hatches and doors
R402.2.10.1	Crawl space wall insulation installations
R402.4.1.1	Installation
R402.4.1.2	Testing
R402.5	Maximum fenestration *U*-factor and SHGC
Mechanical	
R403.1	Controls
R403.3, including R403.3.1, except Sections R403.3.2, R403.3.3 and R403.3.6	Ducts
R403.4	Mechanical system piping insulation
R403.5.1	Heated water circulation and temperature maintenance systems
R403.5.3	Drain water heat recovery units
R403.6	Mechanical ventilation
R403.7	Equipment sizing and efficiency rating
R403.8	Systems serving multiple dwelling units
R403.9	Snow melt and ice systems
R403.10	Energy consumption of pools and spas
R403.11	Portable spas
R403.12	Residential pools and permanent residential spas
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls

a. Reference to a code section includes all the relative subsections except as indicated in the table.

R405.3.2.1 Compliance report for permit application. A compliance report submitted with the application for building permit shall include the following:

1. Building street address, or other *building site* identification.
2. The name of the individual performing the analysis and generating the compliance report.
3. The name and version of the compliance software tool.
4. Documentation of all inputs entered into the software used to produce the results for the reference design and/or the rated home.
5. A certificate indicating that the proposed design complies with Section R405.3. The certificate shall document the building components' energy specifications that are included in the calculation including: component-level insulation *R*-values or *U*-factors; duct system and building envelope air leakage testing assumptions; and the type and rated efficiencies of proposed heating, cooling, mechanical ventilation and service water-heating equipment to be installed. If on-site renewable energy systems will be installed, the certificate shall report the type and production size of the proposed system.
6. Where a site-specific report is not generated, the proposed design shall be based on the worst-case orientation and configuration of the rated home.

R405.3.2.2 Compliance report for certificate of occupancy. A compliance report submitted for obtaining the certificate of occupancy shall include the following:

1. Building street address, or other building site identification.
2. Declaration of the total building performance path on the title page of the energy report and the title page of the building plans.
3. A statement, bearing the name of the individual performing the analysis and generating the report, indicating that the as-built building complies with Section R405.3.
4. The name and version of the compliance software tool.
5. A site-specific energy analysis report that is in compliance with Section R405.3.
6. A final confirmed certificate indicating compliance based on inspection, and a statement indicating that the confirmed rated design of the built home complies with Section R405.3. The certificate shall report the energy features that were confirmed to be in the home, including component-level insulation *R*-values or *U*-factors; results from any required duct system and building envelope air leakage testing; and the type and rated efficiencies of the heating, cooling, mechanical ventilation and service water-heating equipment installed.
7. When on-site renewable energy systems have been installed, the certificate shall report the type and production size of the installed system.

R405.4 Calculation procedure. Calculations of the performance design shall be in accordance with Sections R405.4.1 and R405.4.2.

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R405.4.1 General. Except as specified by this section, the *standard reference design* and *proposed design* shall be configured and analyzed using identical methods and techniques.

R405.4.2 Residence specifications. The *standard reference design* and *proposed design* shall be configured and analyzed as specified by Table R405.4.2(1). Table R405.4.2(1) shall include, by reference, all notes contained in Table R402.1.3.

TABLE R405.4.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Above-grade walls	Type: mass where the proposed wall is a mass wall; otherwise wood frame.	As proposed
	Gross area: same as proposed.	As proposed
	U-factor: as specified in Table R402.1.2.	As proposed
	Solar absorptance = 0.75.	As proposed
	Emittance = 0.90.	As proposed
Basement and crawl space walls	Type: same as proposed.	As proposed
	Gross area: same as proposed.	As proposed
	U-factor: as specified in Table R402.1.2, with the insulation layer on the interior side of the walls.	As proposed
Above-grade floors	Type: wood frame.	As proposed
	Gross area: same as proposed.	As proposed
	U-factor: as specified in Table R402.1.2.	As proposed
Ceilings	Type: wood frame.	As proposed
	Gross area: same as proposed.	As proposed
	U-factor: as specified in Table R402.1.2.	As proposed
Roofs	Type: composition shingle on wood sheathing.	As proposed
	Gross area: same as proposed.	As proposed
	Solar absorptance = 0.75.	As proposed
	Emittance = 0.90.	As proposed
Attics	Type: vented with an aperture of 1 ft^2 per 300 ft^2 of ceiling area.	As proposed
Foundations	Type: same as proposed.	As proposed
	Foundation wall area above and below grade and soil characteristics: same as proposed.	As proposed
Opaque doors	Area: 40 ft^2.	As proposed
	Orientation: North.	As proposed
	U-factor: same as fenestration as specified in Table R402.1.2.	As proposed
Vertical fenestration other than opaque doors	Total area[h] = (a) The proposed glazing area, where the proposed glazing area is less than 15 percent of the conditioned floor area. (b) 15 percent of the conditioned floor area, where the proposed glazing area is 15 percent or more of the conditioned floor area.	As proposed
	Orientation: equally distributed to four cardinal compass orientations (N, E, S & W).	As proposed
	U-factor: as specified in Table R402.1.2.	As proposed
	SHGC: as specified in Table R402.1.2 except for climate zones without an SHGC requirement, the SHGC shall be equal to 0.40.	As proposed
	Interior shade fraction: 0.92 – (0.21 × SHGC for the standard reference design).	Interior shade fraction: 0.92 – (0.21 × SHGC as proposed)
	External shading: none	As proposed

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TABLE R405.4.2(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Skylights	None	As proposed
Thermally isolated sunrooms	None	As proposed
Air exchange rate	The air leakage rate at a pressure of 0.2 inch w.g. (50 Pa) shall be Climate Zones 0 through 2: 5.0 air changes per hour. Climate Zones 3 through 8: 3.0 air changes per hour.	The measured air exchange rate.[a]
	The mechanical ventilation rate shall be in addition to the air leakage rate and shall be the same as in the proposed design, but not greater than $0.01 \times CFA + 7.5 \times (N_{br} + 1)$ where: CFA = conditioned floor area, ft^2. N_{br} = number of bedrooms. The mechanical ventilation system type shall be the same as in the proposed design. Energy recovery shall not be assumed for mechanical ventilation.	The mechanical ventilation rate[b] shall be in addition to the air leakage rate and shall be as proposed.
Mechanical ventilation	Where mechanical ventilation is not specified in the proposed design: None Where mechanical ventilation is specified in the proposed design, the annual vent fan energy use, in units of kWh/yr, shall equal $(1/e_f) \times [0.0876 \times CFA + 65.7 \times (N_{br} + 1)]$ where: e_f = the minimum fan efficacy, as specified in Table 403.6.2, corresponding to the system type at a flow rate of $0.01 \times CFA + 7.5 \times (N_{br} + 1)$ CFA = conditioned floor area, ft^2. N_{br} = number of bedrooms.	As proposed
Internal gains	IGain, in units of Btu/day per dwelling unit, shall equal $17{,}900 + 23.8 \times CFA + 4{,}104 \times N_{br}$ where: CFA = conditioned floor area, ft^2. N_{br} = number of bedrooms.	Same as standard reference design.
Internal mass	Internal mass for furniture and contents: 8 pounds per square foot of floor area.	Same as standard reference design, plus any additional mass specifically designed as a thermal storage element[c] but not integral to the building envelope or structure.
Structural mass	For masonry floor slabs: 80 percent of floor area covered by R-2 carpet and pad, and 20 percent of floor directly exposed to room air.	As proposed
	For masonry basement walls: as proposed, but with insulation as specified in Table R402.1.3, located on the interior side of the walls.	As proposed
	For other walls, ceilings, floors, and interior walls: wood frame construction.	As proposed
Heating systems[d, e]	For other than electric heating without a heat pump: as proposed. Where the proposed design utilizes electric heating without a heat pump, the standard reference design shall be an air source heat pump meeting the requirements of Section C403 of the IECC—Commercial Provisions. Capacity: sized in accordance with Section R403.7.	As proposed
Cooling systems[d, f]	As proposed. Capacity: sized in accordance with Section R403.7.	As proposed

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TABLE R405.4.2(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

<table>
<tr><th>BUILDING COMPONENT</th><th>STANDARD REFERENCE DESIGN</th><th colspan="3">PROPOSED DESIGN</th></tr>
<tr><td rowspan="8">Service water heating[d, g]</td><td rowspan="8">As proposed.
Use, in units of gal/day = 25.5 + (8.5 × N_{br})
where:
N_{br} = number of bedrooms.</td><td colspan="3">As proposed
Use, in units of gal/day = 25.5 + (8.5 × N_{br}) × (1 – HWDS)
where:
N_{br} = number of bedrooms.
HWDS = factor for the compactness of the hot water distribution system.</td></tr>
<tr><td colspan="2">Compactness ratio[i] factor</td><td>HWDS</td></tr>
<tr><td>1 story</td><td>2 or more stories</td><td></td></tr>
<tr><td>> 60%</td><td>> 30%</td><td>0</td></tr>
<tr><td>> 30% to ≤ 60%</td><td>> 15% to ≤ 30%</td><td>0.05</td></tr>
<tr><td>> 15% to ≤ 30%</td><td>> 7.5% to ≤ 15%</td><td>0.10</td></tr>
<tr><td>< 15%</td><td>< 7.5%</td><td>0.15</td></tr>
<tr><td>Thermal distribution systems</td><td>Duct insulation: in accordance with Section R403.3.1.
A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems.
Duct location: same as proposed design.
Exception: For nonducted heating and cooling systems that do not have a fan, the standard reference design thermal distribution system efficiency (DSE) shall be 1. For tested duct systems, the leakage rate shall be 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area at a pressure of differential of 0.1 inch w.g. (25 Pa).</td><td colspan="3">Duct location: as proposed.
Duct insulation: as proposed.
As tested or, where not tested, as specified in Table R405.4.2(2).</td></tr>
<tr><td>Thermostat</td><td>Type: Manual, cooling temperature setpoint = 75°F;
Heating temperature setpoint = 72°F.</td><td colspan="3">Same as standard reference design.</td></tr>
<tr><td>Dehumidistat</td><td>Where a mechanical ventilation system with latent heat recovery is not specified in the proposed design:
None.
Where the proposed design utilizes a mechanical ventilation system with latent heat recovery:
Dehumidistat type: manual, setpoint = 60% relative humidity.
Dehumidifier: whole-dwelling with integrated energy factor = 1.77 liters/kWh.</td><td colspan="3">Same as standard reference design.</td></tr>
</table>

For SI: 1 square foot = 0.93 m^2, 1 British thermal unit = 1055 J, 1 pound per square foot = 4.88 kg/m^2, 1 gallon (US) = 3.785 L, °C = (°F-32)/1.8, 1 degree = 0.79 rad.

a. Where required by the code official, testing shall be conducted by an approved party. Hourly calculations as specified in the ASHRAE *Handbook of Fundamentals,* or the equivalent, shall be used to determine the energy loads resulting from infiltration.

b. The combined air exchange rate for infiltration and mechanical ventilation shall be determined in accordance with Equation 43 of 2001 ASHRAE *Handbook of Fundamentals,* page 26.24 and the "Whole-house Ventilation" provisions of 2001 ASHRAE *Handbook of Fundamentals,* page 26.19 for intermittent mechanical ventilation.

c. Thermal storage element shall mean a component that is not part of the floors, walls or ceilings that is part of a passive solar system, and that provides thermal storage such as enclosed water columns, rock beds, or phase-change containers. A thermal storage element shall be in the same room as fenestration that faces within 15 degrees (0.26 rad) of true south, or shall be connected to such a room with pipes or ducts that allow the element to be actively charged.

d. For a proposed design with multiple heating, cooling or water heating systems using different fuel types, the applicable standard reference design system capacities and fuel types shall be weighted in accordance with their respective loads as calculated by accepted engineering practice for each equipment and fuel type present.

e. For a proposed design without a proposed heating system, a heating system having the prevailing federal minimum efficiency shall be assumed for both the standard reference design and proposed design.

f. For a proposed design home without a proposed cooling system, an electric air conditioner having the prevailing federal minimum efficiency shall be assumed for both the standard reference design and the proposed design.

g. For a proposed design with a nonstorage-type water heater, a 40-gallon storage-type water heater having the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For a proposed design without a proposed water heater, a 40-gallon storage-type water heater having the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed for both the proposed design and standard reference design.

(continued)

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TABLE R405.4.2(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

h. For residences with conditioned basements, R-2 and R-4 residences, and for townhouses, the following formula shall be used to determine glazing area:

$AF = A_s \times FA \times F$

where:

AF = Total glazing area.

A_s = Standard reference design total glazing area.

FA = (Above-grade thermal boundary gross wall area)/(above-grade boundary wall area + 0.5 × below-grade boundary wall area).

F = (above-grade thermal boundary wall area)/(above-grade thermal boundary wall area + common wall area) or 0.56, whichever is greater.

and where:

Thermal boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.

Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.

Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

i. The factor for the compactness of the hot water distribution system is the ratio of the area of the rectangle that bounds the source of hot water and the fixtures that it serves (the "hot water rectangle") divided by the floor area of the dwelling.
   1. Sources of hot water include water heaters, or in multiple-family buildings with central water heating systems, circulation loops or electric heat traced pipes.
   2. The hot water rectangle shall include the source of hot water and the points of termination of all hot water fixture supply piping.
   3. The hot water rectangle shall be shown on the floor plans and the area shall be computed to the nearest square foot.
   4. Where there is more than one water heater and each water heater serves different plumbing fixtures and appliances, it is permissible to establish a separate hot water rectangle for each hot water distribution system and add the area of these rectangles together to determine the compactness ratio.
   5. The basement or attic shall be counted as a story when it contains the water heater.
   6. Compliance shall be demonstrated by providing a drawing on the plans that shows the hot water distribution system rectangle(s), comparing the area of the rectangle(s) to the area of the dwelling and identifying the appropriate compactness ratio and *HWDS* factor.

TABLE R405.4.2(2)
DEFAULT DISTRIBUTION SYSTEM EFFICIENCIES FOR PROPOSED DESIGNS[a]

DISTRIBUTION SYSTEM CONFIGURATION AND CONDITION	FORCED AIR SYSTEMS	HYDRONIC SYSTEMS[b]
Distribution system components located in unconditioned space	—	0.95
Untested distribution systems entirely located in conditioned space[c]	0.88	1
"Ductless" systems[d]	1	—

a. Default values in this table are for untested distribution systems, which must still meet minimum requirements for duct system insulation.

b. Hydronic systems shall mean those systems that distribute heating and cooling energy directly to individual spaces using liquids pumped through closed-loop piping and that do not depend on ducted, forced airflow to maintain space temperatures.

c. Entire system in conditioned space shall mean that no component of the distribution system, including the air-handler unit, is located outside of the conditioned space.

d. Ductless systems shall be allowed to have forced airflow across a coil but shall not have any ducted airflow external to the manufacturer's air-handler enclosure.

R405.5 Calculation software tools. Calculation software, where used, shall be in accordance with Sections R405.5.1 through R405.5.3.

R405.5.1 Minimum capabilities. Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the *standard reference design* and the *proposed design* and shall include the following capabilities:

1. Computer generation of the *standard reference design* using only the input for the *proposed design.* The calculation procedure shall not allow the user to directly modify the building component characteristics of the *standard reference design.*
2. Calculation of whole-building (as a single *zone*) sizing for the heating and cooling equipment in the *standard reference design* residence in accordance with Section R403.7.
3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing.
4. Printed *code official* inspection checklist listing each of the *proposed design* component characteristics from Table R405.4.2(1) determined by the analysis to provide compliance, along with their respective performance ratings such as *R*-value, *U*-factor, SHGC, HSPF, AFUE, SEER and EF.

R405.5.2 Specific approval. Performance analysis tools meeting the applicable provisions of Section R405 shall be permitted to be *approved.* Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall be permitted to approve such tools for a specified application or limited scope.

R405.5.3 Input values. When calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from an *approved* source.

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SECTION R406
ENERGY RATING INDEX COMPLIANCE ALTERNATIVE

R406.1 Scope. This section establishes criteria for compliance using an Energy Rating Index (ERI) analysis.

R406.2 ERI compliance. Compliance based on the ERI requires that the rated design meets all of the following:

1. The requirements of the sections indicated within Table R406.2.
2. Maximum ERI of Table R406.5.

TABLE R406.2
REQUIREMENTS FOR ENERGY RATING INDEX

SECTION[a]	TITLE
General	
R401.2.5	Additional efficiency packages
R401.3	Certificate
Building Thermal Envelope	
R402.1.1	Vapor retarder
R402.2.3	Eave baffle
R402.2.4.1	Access hatches and doors
R402.2.10.1	Crawl space wall insulation installation
R402.4.1.1	Installation
R402.4.1.2	Testing
Mechanical	
R403.1	Controls
R403.3 except Sections R403.3.2, R403.3.3 and R403.3.6	Ducts
R403.4	Mechanical system piping insulation
R403.5.1	Heated water calculation and temperature maintenance systems
R403.5.3	Drain water heat recovery units
R403.6	Mechanical ventilation
R403.7	Equipment sizing and efficiency rating
R403.8	Systems serving multiple dwelling units
R403.9	Snow melt and ice systems
R403.10	Energy consumption of pools and spas
R403.11	Portable spas
R403.12	Residential pools and permanent residential spas
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R406.3	Building thermal envelope

a. Reference to a code section includes all of the relative subsections except as indicated in the table.

R406.3 Building thermal envelope. Building and portions thereof shall comply with Section R406.3.1 or R406.3.2.

R406.3.1 On-site renewables are not included. Where on-site renewable energy is not included for compliance using the ERI analysis of Section R406.4, the proposed total building thermal envelope UA, which is sum of *U*-factor times assembly area, shall be less than or equal to the building thermal envelope UA using the prescriptive *U*-factors from Table R402.1.2 multiplied by 1.15 in accordance with Equation 4-1. The area-weighted maximum fenestration SHGC permitted in Climate Zones 0 through 3 shall be 0.30.

$$UA_{\text{Proposed design}} = 1.15 \times UA_{\text{Prescriptive reference design}}$$

(Equation 4-1)

R406.3.2 On-site renewables are included. Where on-site renewable energy is included for compliance using the ERI analysis of Section R406.4, the *building thermal envelope* shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2018 *International Energy Conservation Code*.

R406.4 Energy Rating Index. The Energy Rating Index (ERI) shall be determined in accordance with RESNET/ICC 301 except for buildings covered by the *International Residential Code*, the ERI reference design ventilation rate shall be in accordance with Equation 4-2.

Ventilation rate, CFM = (0.01 × total square foot area of house) + [7.5 × (number of bedrooms + 1)]

(Equation 4-2)

Energy used to recharge or refuel a vehicle used for transportation on roads that are not on the building site shall not be included in the *ERI reference design* or the *rated design*. For compliance purposes, any reduction in energy use of the rated design associated with on-site renewable energy shall not exceed 5 percent of the total energy use.

R406.5 ERI-based compliance. Compliance based on an ERI analysis requires that the *rated proposed design* and confirmed built dwelling be shown to have an ERI less than or equal to the appropriate value indicated in Table R406.5 when compared to the *ERI reference design*.

TABLE R406.5
MAXIMUM ENERGY RATING INDEX

CLIMATE ZONE	ENERGY RATING INDEX
0-1	52
2	52
3	51
4	54
5	55
6	54
7	53
8	53

R406.6 Verification by approved agency. Verification of compliance with Section R406 as outlined in Sections R406.4 and R406.6 shall be completed by an *approved* third

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party. Verification of compliance with Section R406.2 shall be completed by the authority having jurisdiction or an *approved* third-party inspection agency in accordance with Section R105.4.

R406.7 Documentation. Documentation of the software used to determine the ERI and the parameters for the *residential building* shall be in accordance with Sections R406.7.1 through R406.7.4.

R406.7.1 Compliance software tools. Software tools used for determining ERI shall be *Approved* Software Rating Tools in accordance with RESNET/ICC 301.

R406.7.2 Compliance report. Compliance software tools shall generate a report that documents that the home and the ERI score of the *rated design* complies with Sections R406.2, R406.3 and R406.4. Compliance documentation shall be created for the proposed design and shall be submitted with the application for the building permit. Confirmed compliance documents of the built *dwelling unit* shall be created and submitted to the code official for review before a certificate of occupancy is issued. Compliance reports shall include information in accordance with Sections R406.7.2.1 and R406.7.2.2.

R406.7.2.1 Proposed compliance report for permit application. Compliance reports submitted with the application for a building permit shall include the following:

1. Building street address, or other *building site* identification.
2. Declare ERI on title page and building plans.
3. The name of the individual performing the analysis and generating the compliance report.
4. The name and version of the compliance software tool.
5. Documentation of all inputs entered into the software used to produce the results for the reference design and/or the rated home.
6. A certificate indicating that the proposed design has an ERI less than or equal to the appropriate score indicated in Table R406.5 when compared to the ERI reference design. The certificate shall document the building component energy specifications that are included in the calculation, including: component level insulation *R*-values or *U*-factors; assumed duct system and building envelope air leakage testing results; and the type and rated efficiencies of proposed heating, cooling, mechanical ventilation, and service water-heating equipment to be installed. If on-site renewable energy systems will be installed, the certificate shall report the type and production size of the proposed system.
7. When a site-specific report is not generated, the proposed design shall be based on the worst-case orientation and configuration of the rated home.

R406.7.2.2 Confirmed compliance report for a certificate of occupancy. A confirmed compliance report submitted for obtaining the certificate of occupancy shall be made site and address specific and include the following:

1. Building street address or other *building site* identification.
2. Declaration of ERI on title page and on building plans.
3. The name of the individual performing the analysis and generating the report.
4. The name and version of the compliance software tool.
5. Documentation of all inputs entered into the software used to produce the results for the reference design and/or the rated home.
6. A final confirmed certificate indicating that the confirmed rated design of the built home complies with Sections R406.2 and R406.4. The certificate shall report the energy features that were confirmed to be in the home, including: component-level insulation *R*-values or *U*-factors; results from any required duct system and building envelope air leakage testing; and the type and rated efficiencies of the heating, cooling, mechanical ventilation, and service water-heating equipment installed. Where on-site renewable energy systems have been installed on or in the home, the certificate shall report the type and production size of the installed system.

R406.7.3 Renewable energy certificate (REC) documentation. Where on-site renewable energy is included in the calculation of an ERI, one of the following forms of documentation shall be provided to the code official:

1. Substantiation that the RECs associated with the on-site renewable energy are owned by, or retired on behalf of, the homeowner.
2. A contract that conveys to the homeowner the RECs associated with the on-site renewable energy, or conveys to the homeowner an equivalent quantity of RECs associated with other renewable energy.

R406.7.4 Additional documentation. The *code official* shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the *ERI reference design*.
2. A certification signed by the builder providing the building component characteristics of the *rated design.*
3. Documentation of the actual values used in the software calculations for the *rated design*.

R406.7.5 Specific approval. Performance analysis tools meeting the applicable subsections of Section R406 shall be *approved*. Documentation demonstrating the approval

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of performance analysis tools in accordance with Section R406.7.1 shall be provided.

R406.7.6 Input values. Where calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from RESNET/ICC 301.

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SECTION R407
TROPICAL CLIMATE REGION COMPLIANCE PATH

R407.1 Scope. This section establishes alternative criteria for residential buildings in the tropical region at elevations less than 2,400 feet (731.5 m) above sea level.

R407.2 Tropical climate region. Compliance with this section requires the following:

1. Not more than one-half of the *occupied* space is air conditioned.
2. The *occupied* space is not heated.
3. Solar, wind or other renewable energy source supplies not less than 80 percent of the energy for service water heating.
4. Glazing in *conditioned spaces* has a *solar heat gain coefficient* (SHGC) of less than or equal to 0.40, or has an overhang with a projection factor equal to or greater than 0.30.
5. Permanently installed lighting is in accordance with Section R404.
6. The exterior roof surface complies with one of the options in Table C402.3 of the *International Energy Conservation Code*–Commercial Provisions or the roof or ceiling has insulation with an *R*-value of R-15 or greater. Where attics are present, attics above the insulation are vented and attics below the insulation are unvented.
7. Roof surfaces have a slope of not less than $^1/_4$ unit vertical in 12 units horizontal (21-percent slope). The finished roof does not have water accumulation areas.
8. Operable fenestration provides a ventilation area of not less than 14 percent of the floor area in each room. Alternatively, equivalent ventilation is provided by a ventilation fan.
9. Bedrooms with *exterior walls* facing two different directions have operable fenestration on exterior walls facing two directions.
10. Interior doors to bedrooms are capable of being secured in the open position.
11. A ceiling fan or ceiling fan rough-in is provided for bedrooms and the largest space that is not used as a bedroom.

SECTION R408
ADDITIONAL EFFICIENCY PACKAGE OPTIONS

R408.1 Scope. This section establishes additional efficiency package options to achieve additional energy efficiency in accordance with Section R401.2.5.

R408.2 Additional efficiency package options. Additional efficiency package options for compliance with Section R401.2.1 are set forth in Sections R408.2.1 through R408.2.5.

R408.2.1 Enhanced envelope performance option. The total *building thermal envelope* UA, the sum of *U*-factor times assembly area, shall be less than or equal to 95 percent of the total UA resulting from multiplying the *U*-factors in Table R402.1.2 by the same assembly area as in the proposed building. The UA calculation shall be performed in accordance with Section R402.1.5. The area-weighted average SHGC of all glazed fenestration shall be less than or equal to 95 percent of the maximum glazed fenestration SHGC in Table R402.1.2.

R408.2.2 More efficient HVAC equipment performance option. Heating and cooling *equipment* shall meet one of the following efficiencies:

1. Greater than or equal to 95 AFUE natural gas furnace and 16 SEER air conditioner.
2. Greater than or equal to 10 HSPF/16 SEER air source heat pump.
3. Greater than or equal to 3.5 COP ground source heat pump.

For multiple cooling systems, all systems shall meet or exceed the minimum efficiency requirements in this section and shall be sized to serve 100 percent of the cooling design load. For multiple heating systems, all systems shall meet or exceed the minimum efficiency requirements in this section and shall be sized to serve 100 percent of the heating design load.

R408.2.3 Reduced energy use in service water-heating option. The hot water system shall meet one of the following efficiencies:

1. Greater than or equal to 0.82 EF fossil fuel service water-heating system.
2. Greater than or equal to 2.0 EF electric service water-heating system.
3. Greater than or equal to 0.4 solar fraction solar water-heating system.

R408.2.4 More efficient duct thermal distribution system option. The thermal distribution system shall meet one of the following efficiencies:

1. 100 percent of ducts and air handlers located entirely within the *building thermal envelope*.
2. 100 percent of ductless thermal distribution system or hydronic thermal distribution system located completely inside the *building thermal envelope*.

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3. 100 percent of duct thermal distribution system located in *conditioned space* as defined by Section R403.3.2.

R408.2.5 Improved air sealing and efficient ventilation system option. The measured air leakage rate shall be less than or equal to 3.0 ACH50, with either an Energy Recovery Ventilator (ERV) or Heat Recovery Ventilator (HRV) installed. Minimum HRV and ERV requirements, measured at the lowest tested net supply airflow, shall be greater than or equal to 75 percent Sensible Recovery Efficiency (SRE), less than or equal to 1.1 cubic feet per minute per watt (0.03 m^3/min/watt) and shall not use recirculation as a defrost strategy. In addition, the ERV shall be greater than or equal to 50 percent Latent Recovery/Moisture Transfer (LRMT).

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CHAPTER 5 [RE]
EXISTING BUILDINGS

User note:

About this chapter: *Many buildings are renovated or altered in numerous ways that could affect the energy use of the building as a whole. Chapter 5 requires the application of certain parts of Chapter 4 in order to maintain, if not improve, the conservation of energy by the renovated or altered building.*

SECTION R501
GENERAL

R501.1 Scope. The provisions of this chapter shall control the *alteration*, *repair*, *addition* and change of occupancy of existing *buildings* and structures.

R501.1.1 General. Except as specified in this chapter, this code shall not be used to require the removal, *alteration* or abandonment of, nor prevent the continued use and maintenance of, an existing *building* or *building* system lawfully in existence at the time of adoption of this code. Unaltered portions of the existing *building* or *building* supply system shall not be required to comply with this code.

R501.2 Compliance. *Additions*, *alterations*, *repairs* or changes of occupancy to, or relocation of, an existing *building*, *building* system or portion thereof shall comply with Section R502, R503, R504 or R505, respectively, in this code. Changes where unconditioned space is changed to *conditioned space* shall comply with Section R502.

R501.3 Maintenance. *Buildings* and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices and systems that are required by this code shall be maintained in conformance to the code edition under which installed. The owner or the owner's authorized agent shall be responsible for the maintenance of *buildings* and structures. The requirements of this chapter shall not provide the basis for removal or abrogation of energy conservation, fire protection and safety systems and devices in existing structures.

R501.4 Compliance. *Alterations*, *repairs*, *additions* and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for *alterations*, *repairs*, *additions* and changes of occupancy or relocation, respectively, in this code and the *International Residential Code*, *International Building Code*, *International Existing Building Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *International Plumbing Code*, *International Property Maintenance Code*, *International Private Sewage Disposal Code* and NFPA 70.

R501.5 New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for *repairs*, provided that hazards to life, health or property are not created. Hazardous materials shall not be used where the code for new construction would not allow their use in *buildings* of similar occupancy, purpose and location.

R501.6 Historic buildings. Provisions of this code relating to the construction, *repair, alteration*, restoration and movement of structures, and *change of occupancy* shall not be mandatory for *historic buildings* provided that a report has been submitted to the code official and signed by the owner, a *registered design professional*, or a representative of the State Historic Preservation Office or the historic preservation authority having jurisdiction, demonstrating that compliance with that provision would threaten, degrade or destroy the historic form, fabric or function of the *building*.

SECTION R502
ADDITIONS

R502.1 General. *Additions* to an existing *building*, *building* system or portion thereof shall conform to the provisions of this code as those provisions relate to new construction without requiring the unaltered portion of the existing *building* or *building* system to comply with this code. *Additions* shall not create an unsafe or hazardous condition or overload existing *building* systems. An *addition* shall be deemed to comply with this code where the *addition* alone complies, where the existing *building* and *addition* comply with this code as a single building, or where the *building* with the *addition* does not use more energy than the existing *building*. *Additions* shall be in accordance with Section R502.2 or R502.3.

R502.2 Change in space conditioning. Any unconditioned or low-energy space that is altered to become *conditioned space* shall be required to be brought into full compliance with this code.

Exceptions:

1. Where the simulated performance option in Section R405 is used to comply with this section, the annual energy cost of the *proposed design* is permitted to be 110 percent of the annual energy cost otherwise allowed by Section R405.2.
2. Where the Total UA, as determined in Section R402.1.5, of the existing *building* and the *addition*, and any *alterations* that are part of the project, is less than or equal to the Total UA generated for the existing *building*.
3. Where complying in accordance with Section R405 and the annual energy cost or energy use of the *addition* and the existing *building*, and any

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alterations that are part of the project, is less than or equal to the annual energy cost of the existing *building*. The *addition* and any *alterations* that are part of the project shall comply with Section R405 in its entirety.

R502.3 Prescriptive compliance. *Additions* shall comply with Sections R502.3.1 through R502.3.4.

R502.3.1 Building envelope. New *building* envelope assemblies that are part of the *addition* shall comply with Sections R402.1, R402.2, R402.3.1 through R402.3.5, and R402.4.

Exception: New envelope assemblies are exempt from the requirements of Section R402.4.1.2.

R502.3.2 Heating and cooling systems. HVAC ducts newly installed as part of an *addition* shall comply with Section R403.

Exception: Where ducts from an existing heating and cooling system are extended to an *addition*.

R502.3.3 Service hot water systems. New service hot water systems that are part of the *addition* shall comply with Section R403.5.

R502.3.4 Lighting. New lighting systems that are part of the *addition* shall comply with Section R404.1.

SECTION R503
ALTERATIONS

R503.1 General. *Alterations* to any building or structure shall comply with the requirements of the code for new construction, without requiring the unaltered portions of the existing building or building system to comply with this code. *Alterations* shall be such that the existing building or structure is not less conforming to the provisions of this code than the existing *building* or structure was prior to the *alteration*.

Alterations shall not create an unsafe or hazardous condition or overload *existing* building systems. *Alterations* shall be such that the existing *building* or structure does not use more energy than the existing building or structure prior to the *alteration*. *Alterations* to existing *buildings* shall comply with Sections R503.1.1 through R503.1.4.

R503.1.1 Building envelope. Building envelope assemblies that are part of the *alteration* shall comply with Section R402.1.2 or R402.1.4, Sections R402.2.1 through R402.2.12, R402.3.1, R402.3.2, R402.4.3 and R402.4.5.

Exception: The following alterations shall not be required to comply with the requirements for new construction provided that the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation.
3. Construction where the existing roof, wall or floor cavity is not exposed.
4. Roof recover.
5. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.
6. Surface-applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided that the code does not require the glazing or fenestration assembly to be replaced.

R503.1.1.1 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for *U*-factor and SHGC as specified in Table R402.1.3. Where more than one replacement fenestration unit is to be installed, an area-weighted average of the *U*-factor, SHGC or both of all replacement fenestration units shall be an alternative that can be used to show compliance.

R503.1.2 Heating and cooling systems. HVAC ducts newly installed as part of an *alteration* shall comply with Section R403.

Exception: Where ducts from an existing heating and cooling system are extended to an *addition*.

R503.1.3 Service hot water systems. New service hot water systems that are part of the *alteration* shall comply with Section R403.5.

R503.1.4 Lighting. New lighting systems that are part of the *alteration* shall comply with Section R404.1.

Exception: *Alterations* that replace less than 10 percent of the luminaires in a space, provided that such alterations do not increase the installed interior lighting power.

SECTION R504
REPAIRS

R504.1 General. *Buildings*, structures and parts thereof shall be repaired in compliance with Section R501.3 and this section. Work on nondamaged components necessary for the required *repair* of damaged components shall be considered to be part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section R501.3, ordinary repairs exempt from *permit*, and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.

R504.2 Application. For the purposes of this code, the following shall be considered to be *repairs*:

1. Glass-only replacements in an existing sash and frame.
2. Roof *repairs*.

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3. *Repairs* where only the bulb, ballast or both within the existing luminaires in a space are replaced provided that the replacement does not increase the installed interior lighting power.

SECTION R505
CHANGE OF OCCUPANCY OR USE

R505.1 General. Any space that is converted to a dwelling unit or portion thereof from another use or occupancy shall comply with this code.

Exception: Where the simulated performance option in Section R405 is used to comply with this section, the annual energy cost of the *proposed design* is permitted to be 110 percent of the annual energy cost allowed by Section R405.2.

R505.1.1 Unconditioned space. Any unconditioned or low-energy space that is altered to become a *conditioned space* shall comply with Section R502.

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CHAPTER 6 [RE]
REFERENCED STANDARDS

User note:

About this chapter: *This code contains numerous references to standards promulgated by other organizations that are used to provide requirements for materials and methods of construction. Chapter 6 contains a comprehensive list of all standards that are referenced in this code. These standards, in essence, are part of this code to the extent of the reference to the standard.*

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section R108.

AAMA

American Architectural Manufacturers Association
1827 Walden Office Square
Suite 550
Schaumburg, IL 60173-4268

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors, and Skylights
R402.4.3

ACCA

Air Conditioning Contractors of America
1330 Braddock Place, Suite 350
Alexandria, VA 22314

ANSI/ACCA 2 Manual J—2016: Residential Load Calculation
R403.7

ANSI/ACCA 3 Manual S—2014: Residential Equipment Selection
R403.7

APSP

Pool & Tub Alliance (formerly the APSP)
2111 Eisenhower Avenue, Suite 500
Alexandria, VA 22314

ANSI/APSP/ICC 14—2019: American National Standard for Portable Electric Spa Energy Efficiency
R403.11

ANSI/APSP/ICC 15a—2011: American National Standard for Residential Swimming Pool and Spas—Includes Addenda A Approved January 9, 2013
R403.12

ASHRAE

ASHRAE
180 Technology Parkway NW
Peachtree Corners, GA 30092

ASHRAE 193—2010(RA 2014): Method of Test for Determining the Airtightness of HVAC Equipment
R403.3.4.1

ASHRAE—2001: 2001 ASHRAE Handbook of Fundamentals
Table R405.5.2(1)

ASHRAE—2021: ASHRAE Handbook of Fundamentals
R402.1.5

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ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

C1363—11: Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
R303.1.4.1

E283—2004(2012): Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen
R402.4.5

E779—2010(2018): Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
R402.4.1.2

E1554/E1554M—E2013: Standard Test Methods for Determining Air Leakage of Air Distribution Systems by Fan Pressurization
R403.3.5

E1827—: 2011(2017): Standard Test Methods for Determining Airtightness of Building Using an Orifice Blower Door
R402.4.1.2

E2178—2013: Standard Test Method for Air Permanence of Building Materials
R303.1.5

CSA

CSA Group
8501 East Pleasant Valley Road
Cleveland, OH 44131-5516

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors and Unit Skylights
R402.4.3

CSA B55.1—2015: Test Method for Measuring Efficiency and Pressure Loss of Drain Water Heat Recovery Units
R403.5.3

CSA B55.2—2015: Drain Water Heat Recovery Units
R403.5.3

DASMA

Door & Access Systems Manufacturers Association
1300 Sumner Avenue
Cleveland, OH 44115-2851

105—2017: Test Method for Thermal Transmittance and Air Infiltration of Garage Doors and Rolling Doors
R303.1.3

HVI

Home Ventilating Institute
1740 Dell Range Blvd, Ste H, PMB 450
Cheyenne, WY 82009

916—18: Airflow Test Procedure
Table R403.6.2

ICC

International Code Council, Inc.
500 New Jersey Avenue NW6th Floor
Washington, DC 20001

ANSI/APSP/ICC 14—2019: American National Standard for Portable Electric Spa Energy Efficiency
R403.11

ANSI/APSP/ICC 15a—2020: American National Standard for Residential Swimming Pool and Spa Energy Efficiency
R403.12

ANSI/RESNET/ICC 301—2019: Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index
R406.4

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ICC—continued

ANSI/RESNET/ICC 380—2019: Standard for Testing Airtightness of Building, Dwelling Unit and Sleeping Unit Enclosures; Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems
R402.4.1.2

IBC—21: International Building Code®
R201.3, R303.1.1, R303.2, R402.1.1, R501.4

ICC 400—17: Standard on the Design and Construction of Log Structures
R402.1

ICC 500—2020: ICC/NSSA Standard for the Design and Construction of Storm Shelters
R402.5

IEBC—21: International Existing Building Code®
R501.4

IECC—06: 2006 International Energy Conservation Code®
R202

IECC—09: 2009 International Energy Conservation Code®
R406.2

IECC—15: 2015 International Energy Conservation Code®
Table R406.5

IFC—21: International Fire Code®
R201.3, R501.4

IFGC—21: International Fuel Gas Code®
R201.3, R501.4

IMC—21: International Mechanical Code®
R201.3, R403.3.3, R403.3.4, R403.6, R501.4

IPC—21: International Plumbing Code®
R201.3, R501.4

IPMC—21: International Property Maintenance Code®
R501.4

IPSDC—21: International Private Sewage Disposal Code®
R501.4

IRC—21: International Residential Code®
R201.3, R303.1.1, R303.2, R402.1.1, R402.2.10.1, R403.3.3, R403.3.4, R403.6, R501.4

IEEE

Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, 17th Floor
New York, NY 10016-5997

515.1—2012: IEEE Standard for the Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Commercial Applications
R403.5.1.2

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

70—20: National Electrical Code
R501.4

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NFRC

National Fenestration Rating Council, Inc.
6305 Ivy Lane, Suite 140
Greenbelt, MD 20770

100—2020: Procedure for Determining Fenestration Products *U*-factors
R303.1.3

200—2020: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
R303.1.3

400—2020: Procedure for Determining Fenestration Product Air Leakage
R402.4.3

RESNET

Residential Energy Services Network, Inc.
P.O. Box 4561
Oceanside, CA 92052-4561

ANSI/RESNET/ICC 301—2019: Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index
R406.4, R406.7.1, R406.7.6

ANSI/RESNET/ICC 380—2019: Standard for Testing Airtightness of Building, Dwelling Unit and Sleeping Unit Enclosures; Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems
R402.4.1.2, R403.3.5

UL

UL LLC
333 Pfingsten Road
Northbrook, IL 60062

127—2011: Standard for Factory-Built Fireplaces—with Revisions through July 2016
R402.4.2

515—2015: Standard for Electrical Resistance Trace Heating for Commercial Applications
R403.5.1.2

US-FTC

United States-Federal Trade Commission
600 Pennsylvania Avenue NW
Washington, DC 20580

CFR Title 16 (2015): R-value Rule
R303.1.4

WDMA

Window and Door Manufacturers Association
2025 M Street NW, Suite 800
Washington, DC 20036-3309

AAMA/WDMA/CSA 101/I.S.2/A440—17: North American Fenestration Standard/Specification for Windows, Doors and Skylights
R402.4.3

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APPENDIX RA
BOARD OF APPEALS—RESIDENTIAL

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User note:

About this appendix: *Appendix RA provides criteria for board of appeals members. Also provided are procedures by which the board of appeals should conduct its business.*

SECTION RA101
GENERAL

RA101.1 Scope. A board of appeals shall be established within the jurisdiction for the purpose of hearing applications for modification of the requirements of this code pursuant to the provisions of Section R110. The board shall be established and operated in accordance with this section, and shall be authorized to hear evidence from appellants and the code official pertaining to the application and intent of this code for the purpose of issuing orders pursuant to these provisions.

RA101.2 Application for appeal. Any person shall have the right to appeal a decision of the code official to the board. An application for appeal shall be based on a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.

RA101.2.1 Limitation of authority. The board shall not have authority to waive requirements of this code or interpret the administration of this code.

RA101.2.2 Stays of enforcement. Appeals of notice and orders, other than Imminent Danger notices, shall stay the enforcement of the notice and order until the appeal is heard by the board.

RA101.3 Membership of board. The board shall consist of five voting members appointed by the chief appointing authority of the jurisdiction. Each member shall serve for **[INSERT NUMBER OF YEARS]** years or until a successor has been appointed. The board members' terms shall be staggered at intervals, so as to provide continuity. The code official shall be an ex officio member of said board but shall not vote on any matter before the board.

RA101.3.1 Qualifications. The board shall consist of five individuals, who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.

RA101.3.2 Alternate members. The chief appointing authority is authorized to appoint two alternate members who shall be called by the board chairperson to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership, and shall be appointed for the same term or until a successor has been appointed.

RA101.3.3 Vacancies. Vacancies shall be filled for an unexpired term in the same manner in which original appointments are required to be made.

RA101.3.4 Chairperson. The board shall annually select one of its members to serve as chairperson.

RA101.3.5 Secretary. The chief appointing authority shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings, which shall set forth the reasons for the board's decision, the vote of each member, the absence of a member and any failure of a member to vote.

RA101.3.6 Conflict of interest. A member with any personal, professional or financial interest in a matter before the board shall declare such interest and refrain from participating in discussions, deliberations and voting on such matters.

RA101.3.7 Compensation of members. Compensation of members shall be determined by law.

RA101.3.8 Removal from the board. A member shall be removed from the board prior to the end of their term only for cause. Any member with continued absence from regular meeting of the board may be removed at the discretion of the chief appointing authority.

RA101.4 Rules and procedures. The board shall establish policies and procedures necessary to carry out its duties consistent with the provisions of this code and applicable state law. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be presented.

RA101.5 Notice of meeting. The board shall meet upon notice from the chairperson, within 10 days of the filing of an appeal or at stated periodic intervals.

RA101.5.1 Open hearing. All hearings before the board shall be open to the public. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

RA101.5.2 Quorum. Three members of the board shall constitute a quorum.

RA101.5.3 Postponed hearing. When five members are not present to hear an appeal, either the appellant or the

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appellant's representative shall have the right to request a postponement of the hearing.

RA101.6 Legal counsel. The jurisdiction shall furnish legal counsel to the board to provide members with general legal advice concerning matters before them for consideration. Members shall be represented by legal counsel at the jurisdiction's expense in all matters arising from service within the scope of their duties.

RA101.7 Board decision. The board shall only modify or reverse the decision of the code official by a concurring vote of three or more members.

RA101.7.1 Resolution. The decision of the board shall be by resolution. Every decision shall be promptly filed in writing in the office of the code official within 3 days and shall be open to the public for inspection. A certified copy shall be furnished to the appellant or the appellant's representative and to the code official.

RA101.7.2 Administration. The code official shall take immediate action in accordance with the decision of the board.

RA101.8 Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

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APPENDIX RB

SOLAR-READY PROVISIONS—DETACHED ONE- AND TWO-FAMILY DWELLINGS AND TOWNHOUSES

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User note:

About this appendix: *Harnessing the heat or radiation from the sun's rays is a method to reduce the energy consumption of a building. Although Appendix RB does not require solar systems to be installed for a building, it does require the space(s) for installing such systems, providing pathways for connections and requiring adequate structural capacity of roof systems to support the systems.*

SECTION RB101
SCOPE

RB101.1 General. These provisions shall be applicable for new construction where solar-ready provisions are required.

SECTION RB102
GENERAL DEFINITION

SOLAR-READY ZONE. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

SECTION RB103
SOLAR-READY ZONE

RB103.1 General. New detached one- and two-family dwellings, and townhouses with not less than 600 square feet (55.74 m^2) of roof area oriented between 110 degrees and 270 degrees of true north shall comply with Sections RB103.2 through RB103.8.

Exceptions:

1. New residential buildings with a permanently installed on-site renewable energy system.
2. A building where all areas of the roof that would otherwise meet the requirements of Section RB103 are in full or partial shade for more than 70 percent of daylight hours annually.

RB103.2 Construction document requirements for solar-ready zone. Construction documents shall indicate the solar-ready zone.

RB103.3 Solar-ready zone area. The total solar-ready zone area shall be not less than 300 square feet (27.87 m^2) exclusive of mandatory access or setback areas as required by the *International Fire Code*. New townhouses three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (185.8 m^2) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m^2). The solar-ready zone shall be composed of areas not less than 5 feet (1524 mm) in width and not less than 80 square feet (7.44 m^2) exclusive of access or setback areas as required by the *International Fire Code*.

RB103.4 Obstructions. Solar-ready zones shall be free from obstructions, including but not limited to vents, chimneys, and roof-mounted equipment.

RB103.5 Shading. The solar-ready zone shall be set back from any existing or new permanently affixed object on the building or site that is located south, east or west of the solar zone a distance not less than two times the object's height above the nearest point on the roof surface. Such objects include, but are not limited to, taller portions of the building itself, parapets, chimneys, antennas, signage, rooftop equipment, trees and roof plantings.

RB103.6 Capped roof penetration sleeve. A capped roof penetration sleeve shall be provided adjacent to a solar-ready zone located on a roof slope of not greater than 1 unit vertical in 12 units horizontal (8-percent slope). The capped roof penetration sleeve shall be sized to accommodate the future photovoltaic system conduit, but shall have an inside diameter of not less than $1^1/_4$ inches (32 mm).

RB103.7 Roof load documentation. The structural design loads for roof dead load and roof live load shall be clearly indicated on the construction documents.

RB103.8 Interconnection pathway. Construction documents shall indicate pathways for routing of conduit or plumbing from the solar-ready zone to the electrical service panel or service hot water system.

RB103.9 Electrical service reserved space. The main electrical service panel shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

RB103.10 Construction documentation certificate. A permanent certificate, indicating the solar-ready zone and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

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APPENDIX RC
ZERO ENERGY RESIDENTIAL BUILDING PROVISIONS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

User Note:

About this appendix: *This appendix provides requirements for residential buildings intended to result in net zero energy consumption over the course of a year. Where adopted by ordinance as a requirement, Section RC101 language is intended to replace Section R401.2.*

SECTION RC101
COMPLIANCE

RC101.1 Compliance. Existing residential buildings shall comply with Chapter 5. New residential buildings shall comply with Section RC102.

SECTION RC102
ZERO ENERGY RESIDENTIAL BUILDINGS

RC102.1 General. New *residential buildings* shall comply with Section RC102.2.

RC102.2 Energy Rating Index zero energy score. Compliance with this section requires that the rated design be shown to have a score less than or equal to the values in Table RC102.2 when compared to the Energy Rating Index (ERI) reference design determined in accordance with RESNET/ICC 301 for both of the following:

1. ERI value not including on-site power production (OPP) calculated in accordance with RESNET/ICC 301.
2. ERI value including on-site power production calculated in accordance with RESNET/ICC 301 with the OPP in Equation 4.1.2 of RESNET/ICC 301 adjusted in accordance with Equation RC-1.

Adjusted OPP = OPP + CREF + REPC **(Equation RC-1)**

where:

CREF = Community Renewable Energy Facility power production—the yearly energy, in kilowatt hour equivalent (kWheq), contracted from a community renewable energy facility that is qualified under applicable state and local utility statutes and rules, and that allocates bill credits to the rated home.

REPC = Renewable Energy Purchase Contract power production—the yearly energy, in kilowatt hour equivalent (kWheq), contracted from an energy facility that generates energy with photovoltaic, solar thermal, geothermal energy or wind systems, and that is demonstrated by an energy purchase contract or lease with a duration of not less than 15 years.

TABLE RC102.2
MAXIMUM ENERGY RATING INDEX[a]

CLIMATE ZONE	ENERGY RATING INDEX NOT INCLUDING OPP	ENERGY RATING INDEX INCLUDING ADJUSTED OPP (as proposed)
1	43	0
2	45	0
3	47	0
4	47	0
5	47	0
6	46	0
7	46	0
8	46	0

a. The building shall meet the requirements of Table R406.2, and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or R402.1.3 of the 2015 *International Energy Conservation Code*.

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EDITORIAL CHANGES – SECOND PRINTING

Page C3-20, **TABLE C301.1—continued:** column 1, row 41 now reads . . . 4B Catron

Page C3-36, **Section C303.1.3:** paragraph 3, lines 10 through 12 now read . . . from Table C303.1.3(3). For Tubular Daylighting Devices, VT_{annual} shall be measured and rated in accordance with NFRC 203.

Page C4-3, **TABLE C402.1.3:** column 13, row 18, line 2 now reads . . . 48

Page C4-3, **TABLE C402.1.3:** column 14, row 18, line 2 now reads . . . 24

Page C4-4, **TABLE C402.1.4:** column 1, row 7 now reads . . . Mass[f]

Page C4-4, **TABLE C402.1.4:** column 1, row 18 now reads . . . Heated slabs

Page C4-4, **TABLE C402.1.4:** column 1, row 21 now reads . . . Swinging door[g]

Page C4-4, **TABLE C402.1.4:** column 1, row 22 now reads . . . Garage door < 14% glazing[h]

Page C4-4, **TABLE C402.1.4:** Note f has been deleted

Page C4-4, **TABLE C402.1.4:** Note f now reads . . . f.“ Mass walls” shall be in accordance with Section C402.2.2.

Page C4-4, **TABLE C402.1.4:** Note g now reads . . . g. Swinging door *U*-factors shall be determined in accordance with NFRC-100.

Page C4-4, **TABLE C402.1.4:** Note h now reads . . . h. Garage doors having a single row of fenestration shall have an assembly *U*-factor less than or equal to 0.44 in Climate Zones 0 through 6 and less than or equal to 0.36 in Climate Zones 7 and 8, provided that the fenestration area is not less than 14 percent and not more than 25 percent of the total door area.

Page C4-7, **TABLE C402.3:** row 1 now reads . . . Three-year-aged solar reflectance[b] of 0.55 and 3-year aged thermal emittance[c] of 0.75

Page C4-10, **Section C402.4.4:** line 5 now reads . . . sidelit *daylight* zones.

Page C4-13, **Section C402.5.11.1:** line 2 now reads . . . comply with Section C403.14.

Page C4-37. **Section C403.4.2.3:** line 2 now reads . . . and stop controls shall be provided for each HVAC

Page C4-44. **Section C403.7.4.2:** Exception 6, line 3 now reads . . . 0, 3C, 4C, 5B, 5C, 6B, 7 and 8.

Page C4-50. new section added and now reads . . .

C403.10.6 Heat recovery for space conditioning in healthcare facilities. Where heating water is used for space heating, a condenser heat recovery system shall be installed provided that all of the following are true:

1. The building is a Group I-2, Condition 2 occupancy.
2. The total design chilled water capacity for the Group I-2,Condition 2 occupancy, either air cooled or water cooled, required at cooling design conditions exceeds 3,600,000 Btu/h (1100 kw) of cooling.
3. Simultaneous heating and cooling occurs above 60°F (16°C) outdoor air temperature.

The required heat recovery system shall have a cooling capacity that is not less than 7 percent of the total design chilled water capacity of the Group I-2, Condition 2 occupancy at peak design conditions.

Exceptions:

1. Buildings that provide 60 percent or more of their reheat energy from on-site renewable energy or site-recovered energy.
2. Buildings in Climate Zones 5C, 6B, 7 and 8.

Page C4-58, **TABLE C404.5.2.1:** column 8, row 2 now reads . . . PE-RT SDR 9

Page C4-60, **Section C405.2.1.2:** Item 2, lines 3 and 4 now read . . . unoccupied setpoint of not more than 50 percent of full power within 20 minutes after all

Page C4-60, **Section C405.2.1.4:** lines 3 and 4 now read . . . uniformly reduce lighting power to an occupied setpoint not more than 50 percent of full power within

Page C4-62, **Section C405.2.4.2:** Item 3, lines 7 through 9 now read . . . tration to the nearest full height wall, or up to 0.5 times the height from the floor to the top of the fenestration, whichever is less, as indicated

Page C4-63, **FIGURE C405.2.4.2(1)** now reads as shown

Page C4-72, **Section C405.9.2.1** now reads . . . **C405.9.2.1 Energy recovery.** Escalators shall be designed to recover electrical energy when resisting overspeed in the down direction.

Page C4-78, **Section C406.3:** section title now reads . . . **C406.3 Reduced lighting power.**

Page C4-80, **TABLE C406.1(4):** column 11, row 6 now reads . . . 1

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Page C-4-83, **TABLE C406.12(2):** column 4 now reads . . .

IDLE ENERGY RATE
400 watts
530 watts
670 watts
800 watts
6,250 Btu/h
8,350 Btu/h
10,400 Btu/h
12,500 Btu/h

Page C4-84, **TABLE C406.12(3):** column 2, row 3 now reads . . . ≤ .50 kW

Page C4-84, **TABLE C406.12(3):** column 2, row 4 now reads . . . ≤ .70 kW

Page C4-84, **Section C407.2:** Item 2, line 1 now reads . . . 2. An annual energy cost that is less than or equal to 80

Page R2-2, definition **HIGH-EFFICACY LIGHT SOURCES** now reads . . .

HIGH-EFFICACY LIGHT SOURCES. Any lamp with an efficacy of not less than 65 lumens per watt, or luminaires with an efficacy of not less than 45 lumens per watt.

Page R3-20, **TABLE R301.1—continued:** column 1, row 41 now reads . . . 4B Catron

Page R4-2, **TABLE R402.1.2:** column 4, row 7 now reads . . . 0.40

Page R4-3, **TABLE R402.1.3:** column 6 now reads . . .

WOOD FRAME WALL *R*-VALUE[g]
13 or 0&10ci
13 or 0&10ci
13 or 0&10ci
20 or 13&5ci[h] or 0&15ci[h]
30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]
30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]
30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]
30 or 20&5ci[h] or 13&10ci[h] or 0&20ci[h]

Page R4-3, **TABLE R402.1.3:** column 9, row 7 now reads . . . 15ci or 19 or 13&5ci

Page R4-3, **TABLE R402.1.3:** column 11, row 7 now reads . . . 15ci or 19 or 13&5ci

Page R4-3, **TABLE R402.1.3:** column 9, row 8 now reads . . . 15ci or 19 or 13&5ci

Page R4-3, **TABLE R402.1.3:** column 11, row 8 now reads . . . 15ci or 19 or 13&5ci

Page R4-3, **TABLE R402.1.3:** column 9, row 9 now reads . . . 15ci or 19 or 13&5ci

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Page R4-3, **TABLE R402.1.3:** column 11, row 9 now reads . . . 15ci or 19 or 13&5ci

Page R4-3, **TABLE R402.1.3:** Note c, line 2 now reads . . . 19 or 13&5ci" means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation on the interior side of the wall;

Page R4-3, **TABLE R402.1.3:** Note g, line 1 now reads . . . g. The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, "13&5" means R-13 cavity insulation plus R-5

Page R4-4, **Section R402.2.1** title now reads . . . **R402.2.1 Ceilings with attics.**

Page R4-4, **Section R402.2.1:** lines 8 and 9 now read . . . ceiling or attic, installing R-49 over 100 percent of the ceiling or attic area requiring insulation shall satisfy the

Page R4-4, **Section R402.2.4.1:** lines 8 through 10 now read . . . a wood-framed or equivalent baffle, retainer, or dam shall be installed to prevent loose-fill insulation from spilling into living space from higher to lower sections

Page R4-7, **TABLE R402.4.1.1:** column 2, row 9, lines 1 and 2 now read . . . Duct and flue shafts to exterior or unconditioned space shall be sealed.

Page R4-9, **Section R402.4.1.2:** Exception 2, lines 8 and 9 now read . . . 0.2 inch w.g. (50 Pa), shall be permitted in all climate zones for:

Page R4-11, **Section R403.3.5:** new paragraph added after Item 2 now reads . . . A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*.

Page R4-11, **Section R403.3.5:** Exception line 2 now reads . . . required for ducts serving ventilation systems that are

Page R4-12, **Section R403.6** now reads . . .**R403.6 Mechanical ventilation.** The *buildings* complying with Section R402.4.1 shall be provided with ventilation that complies with the requirements of Section M1505 of the *International Residential Code* or *International Mechanical Code*, as applicable, or with other *approved* means of *ventilation*. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the *ventilation* system is not operating.

Page R4-13, **Section R404.1.1:** line 3 now reads . . . C405.5.

Page R4-13, **Section R405.2:** Item 2, line 1 now reads . . . The building thermal envelope shall be greater than

Page R4-13, **Section R405.3.2:** paragraph 2, line 2 now reads . . . dance with Sections R405.3.2.1 and R405.3.2.2.

Page R4-14, **TABLE R405.2:** column 1, row 28 now reads . . . R404.2

Page R4-16, **TABLE R405.4.2(1)—continued:** column 2, row 6, line 7 now reads . . . e_f = the minimum fan efficacy, as specified in Table 403.6.2,

Page R4-17, **TABLE R405.4.2(1)—continued:** column 2, row 2, line 2 now reads . . . Use, in units of gal/day = $25.5 + (8.5 \times N_{br})$

Page R4-17, **TABLE R405.4.2(1)—continued:** column 3, row 9, line 2 now reads . . .

Duct location: as proposed. Duct insulation: as proposed. As tested or, where not tested, as specified in Table R405.4.2(2).

Page R4-18, **Section R405.5.1:** Item 2 line 4 now reads . . . dance with Section R403.7.

Page R4-19, **TABLE R406.2:** column 1, row 27 now reads . . . R404.2

Page R4-19, **Section R406.3.2:** line 6 now reads . . . R402.1.4 of the 2018 *International Energy Conservation*

Page R4-21, **Section R408.2.3:** Item 1, line 1 now reads . . . 1. Greater than or equal to 0.82 EF fossil fuel service

Page Appendix RC-1, **TABLE RC102.2:** Note a, lines 3 and 4 now read . . . efficiency and SHGC in Table R402.1.2 or R402.1.3 of the 2015 *International Energy Conservation Code*.

For the complete errata history of this code, please visit: https://www.iccsafe.org/errata-central/

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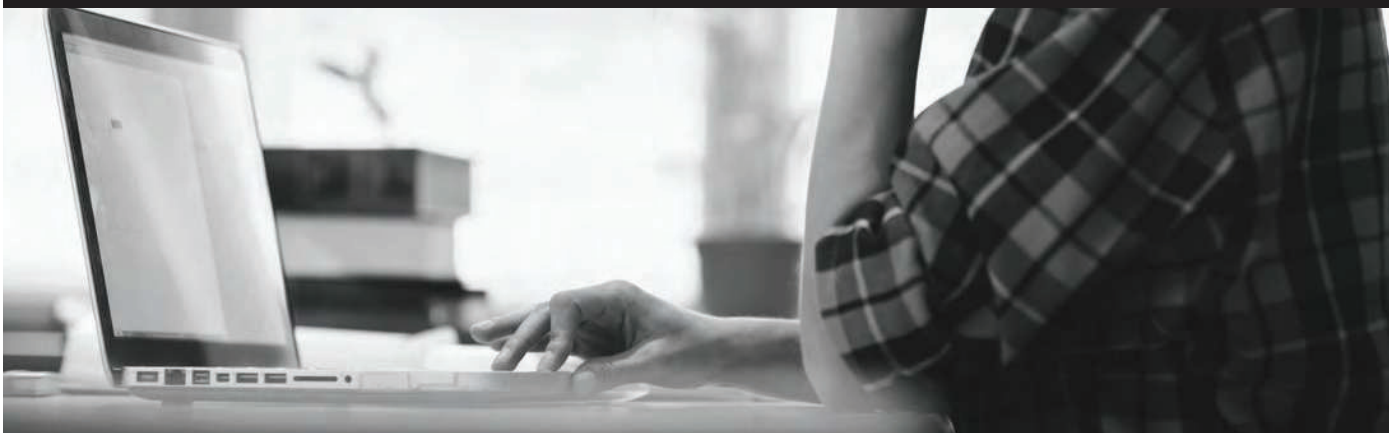
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Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Harley Gifford, Deputy City Attorney

SUBJECT: AN ORDINANCE AMENDING SECTION 4-6-2 OF THE PUEBLO MUNICIPAL CODE BY REPEALING LOCAL AMENDMENTS TO CHAPTER 11 OF THE 2021 INTERNATIONAL RESIDENTIAL CODE

SUMMARY:

Attached is an Ordinance amending Section 4-6-2 of the Pueblo Municipal Code by repealing in their entirety subsections (o), (p), and (q) thereof. Those three subsections are local amendments to Chapter 11 (Energy Efficiency) of the 2021 International Residential Code adopted under Ordinance No. 10468 (effective June 29, 2023). Specifically, they amend Table R402.1.2 (Maximum Assembly U-Factors and Fenestration Requirements), Table R402.1.3 (Insulation Minimum R-Values and Fenestration Requirements by Components), and Section R404.1 (Lighting equipment) of the International Residential Code by substituting residential energy efficiency values for those prescribed by the unamended 2021 International Energy Conservation Code at the corresponding Sections R402.1.2, R402.1.3, and R404.1. Repealing these subsections aligns the residential energy provisions of the International Residential Code as applied in the City with the residential energy provisions of the unamended 2021 International Energy Conservation Code being re-adopted in the companion Ordinance, and is necessary to satisfy the equivalent-or-better-performance standard at C.R.S. § 31-15-602(3.5)(a).

On June 29, 2023, City Council adopted Ordinance No. 10468, which amended Chapter 6 of Title IV of the Pueblo Municipal Code to adopt the 2021 International Residential Code published by the International Code Council, Inc., with local amendments codified at Section 4-6-2(a) through (s) of the Pueblo Municipal Code. Subsections (o), (p), and (q), which this Ordinance repeals, are part of the local amendments adopted by Ordinance No. 10468.This Ordinance is the third in a series of three related Ordinances. This Ordinance completes the residential energy code compliance package by removing the parallel local amendments operating through the International Residential Code. The three Ordinances together bring the City into

compliance with C.R.S. § 31-15-602(3.5)(a), which requires municipalities updating any building code between July 1, 2023 and June 30, 2026 to adopt an energy code achieving equivalent or better performance than the 2021 International Energy Conservation Code and the model electric ready and solar ready code language adopted by the Colorado Energy Code Board.

PREVIOUS COUNCIL ACTION:

On June 29, 2023, City Council adopted Ordinance No. 10468, which amended Chapter 6 of Title IV of the Pueblo Municipal Code to adopt the 2021 International Residential Code published by the International Code Council, Inc., with local amendments codified at Section 4-6-2(a) through (s) of the Pueblo Municipal Code. Subsections (o), (p), and (q), which this Ordinance repeals, are part of the local amendments adopted by Ordinance No. 10468.

BACKGROUND:

In 2022, the Colorado General Assembly enacted House Bill 22-1362, codified in part at C.R.S. § 31-15-602(3.5)(a), directing municipalities and counties that update any building code between July 1, 2023 and June 30, 2026 to adopt an energy code achieving equivalent or better energy performance than the 2021 International Energy Conservation Code and the model electric ready and solar ready code language adopted by the Colorado Energy Code Board.

The residential provisions of the 2021 International Energy Conservation Code are duplicated, by design, in Chapter 11 (Energy Efficiency) of the 2021 International Residential Code. The two codes operate as parallel tracks for the same regulated buildings: the International Energy Conservation Code residential provisions and the International Residential Code Chapter 11. Local amendments to either code's residential energy provisions therefore must be addressed in parallel to maintain a consistent and compliant residential energy regime.

Subsections (o), (p), and (q) of Section 4-6-2 of the Pueblo Municipal Code are local amendments to Sections R402.1.2, R402.1.3, and R404.1 of the International Residential Code. Each subsection sets values that are weaker than the corresponding unamended provisions of the 2021 International Energy Conservation Code. Specifically: subsection (o) sets a Ceiling U-Factor of 0.026 and a Wood Frame Wall U-Factor of 0.06 for Climate Zone 5 and Marine 4, against unamended International Energy Conservation Code values of 0.024 and 0.045 respectively; subsection (p) sets a Ceiling R-Value of R-49 and a minimum Wood Frame Wall R-Value of R-20, against unamended International Energy Conservation Code values of R-60 and R-30; subsection (q) sets a 90% threshold for permanently installed lighting fixtures containing high-efficiency lighting sources, against the unamended International Energy Conservation Code requirement that all such fixtures contain high-efficacy lighting sources. So long as these subsections remain in effect, the City's residential energy code regime does not achieve equivalent or better performance than the unamended 2021 International Energy Conservation Code.

The companion Ordinance re-adopting the 2021 International Energy Conservation Code repeals the parallel local amendments codified at Section 4-2-2(aa), (bb), and

(cc) of the Pueblo Municipal Code, which amend International Energy Conservation Code Sections R402.1.2, R402.1.3, and R404.1 in substantively identical terms. This Ordinance performs the corresponding repeal on the International Residential Code side.

This Ordinance is a straightforward amendment of the Pueblo Municipal Code under City Charter Section 3-19. It does not adopt any code by reference and therefore does not require the procedures set forth at C.R.S. §§ 31-16-201 through 31-16-208. The 2021 International Residential Code remains adopted under Ordinance No. 10468 with the remaining local amendments at Section 4-6-2(a) through (n), (r), and (s) in full force and effect.

FINANCIAL IMPLICATIONS:

Adoption of this Ordinance, together with the previously adopted Ordinance creating Chapter 12 of Title IV and the companion Ordinance re-adopting the 2021 International Energy Conservation Code, completes the residential energy code compliance package qualifying the City for grant funding under the Colorado Energy Office's building electrification and energy code adoption grant program at C.R.S. § 24-38.5-403. This Ordinance imposes no direct cost on the City and no fee changes for permit applicants beyond those independently set by the Southern Colorado Building Commission and approved by the City and Town of Boone under the Intergovernmental Agreement.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

This Ordinance will follow the procedures for ordinance passage at City Charter Section 3-19, including introduction at one regular meeting of the City Council, publication once in a newspaper of the City at least ten days before final passage, and final passage at a subsequent regular meeting.

ALTERNATIVES:

If this Ordinance is not approved, local amendments at Section 4-6-2(o), (p), and (q) of the Pueblo Municipal Code remain in force and continue to govern residential buildings constructed under the International Residential Code. Those amendments establish residential energy efficiency values weaker than the unamended 2021 International Energy Conservation Code provisions. The City's residential energy code regime would therefore not achieve equivalent or better performance than the 2021 International Energy Conservation Code, defeating the compliance argument under C.R.S. § 31-15-602(3.5)(a) notwithstanding adoption of the companion Ordinance re-adopting the unamended International Energy Conservation Code, and rendering the City ineligible for the Colorado Energy Office grant program at C.R.S. § 24-38.5-403. Continued non-compliance does not carry an immediate penalty under state law but is inconsistent with the City's general obligation under Charter Section 3-5(i) to faithfully execute and comply with all laws of the State of Colorado that apply to the City.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. Ordinance

ORDINANCE NO. _____

AN ORDINANCE AMENDING SECTION 4-6-2 OF THE PUEBLO MUNICIPAL CODE BY REPEALING LOCAL AMENDMENTS TO CHAPTER 11 OF THE 2021 INTERNATIONAL RESIDENTIAL CODE

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Section 4-6-2 of the Pueblo Municipal Code is amended by repealing in their entirety subsections (o), (p), and (q) thereof, to read as follows:

Sec. 4-6-2. Amendments.

(a) Section R103 of the I.R.C., entitled "Department of Building Safety," is amended to read as follows:

"R103 Southern Colorado Building Department - Enforcement Agency.

"Administration and enforcement of this Code and all related and secondary codes are hereby delegated to the Southern Colorado Building Department. Wherever in this Code the phrase 'building official' appears, it shall be construed to refer to the Director or the Building Official of the Southern Colorado Building Department or the Building Official's designated representative. The building official, the building official's designated representatives, and such building inspectors as the building official may appoint, shall be vested with the authority of a law enforcement officer with respect to enforcing this Code and Chapter 6 of Title IV of the Pueblo Municipal Code, including the authority to issue summons and complaints for the violation thereof."

(b) Section R103.1, entitled "Creation of enforcement agency," Section R103.2, entitled "Appointment," and Section R103.3, entitled "Deputies," are deleted.

(c) Subsection R105.2 of the I.R.C., entitled "Work exempt from permit," number 7., is amended to read as follows:

"7. Prefabricated swimming pools accessory to a Group R-3 occupancy, which are installed entirely above ground."

(d) Section R105 of the I.R.C., entitled "Permits," is amended by the addition of Subsection R105.10, entitled "Issuance of permit," to read as follows:

"R105.10 Issuance of permit. A building permit shall be issued only to the contractor performing the work covered by the contract between the owner and the contractor. Such permit shall be delivered only to the contractor or the contractor's authorized representative(s). Should any portion of the work be excluded from the contract, the application or permit shall state the portions so excluded. Should the

contractor be discharged or abandon the work, the contractor shall immediately notify the building official in writing. No further work shall be performed until a successor contractor has been selected who shall notify the building official in writing of the contractor's selection to complete the work."

(e) Subsection R106.1 of the I.R.C., entitled "Submittal documents," is amended to read as follows:

"Construction documents will also include all plans and specifications, drawings, diagrams, calculations, computations, reports, specifications and other necessary data to complete the habitable structure, along with the necessary code study to compare and delineate the occupancy use and fire resistive type of construction within the I.R.C. Each set of plans and specifications shall bear the stamp or seal and signature of an engineer or architect licensed under Title 12 of Colorado Revised Statutes and in accordance with Sections 12-120-216 and 12-120-417, C.R.S., respectively."

(f) Subsection R108.2 of the I.R.C., entitled "Schedule of permit fees," is amended by the addition of two (2) new subsections, R108.2.1 and R108.2.2, to read as follows:

"**R108.2.1 Permit fees.** The fee for each permit shall be as established in the fee schedule adopted by the City Council by resolution.

"**R108.2.2 Plan review fees.** Plan review fees shall be as established in the fee schedule adopted by the City Council by resolution."

(g) Section R110.3.1 of the I.R.C., entitled "Certificate issued," is amended to add a new subsection R110.3.1 to read as follows:

"R110.3.1 Public improvement requirements for a certificate of occupancy. Applications for building permits for buildings or structures for one- and two- family dwelling units and town homes shall be accompanied by a set of plans or a drawing which shows all existing and proposed public improvements required by the ordinances of the City. Foundation plans and soils report shall be prepared by and bear the seal of an architect or engineer licensed to practice in Colorado. Accessory structures shall have plot plans showing all existing and proposed public improvements required by ordinances of the city.

Before any building permit is issued, all applications for building permits and accompanying plans or drawings shall be reviewed by the Director of Public Works to determine whether the proposed construction will require the installation or reconstruction of public improvements. For purposes of this Section, public improvements shall include, but not be limited to, street paving, curbs, gutters, sidewalks, drainage facilities and the dedication of land for such purposes. Upon request, the Director of Public Works shall provide a written statement of the public improvements that will be required as a condition for the issuance of a building permit and a certificate of occupancy. No certificate of occupancy shall be issued for any structure or building until all public improvements required by the ordinances of the City shall be constructed in full compliance with City engineering regulations, design standards and construction specifications as adopted by

resolution of the City Council. Acceptance of required public improvements shall be completed upon written notification signed by the Director of Public Works.

If it is determined by the Director of Public Works that any such public improvements are necessitated by the proposed construction, a condition shall be inserted in any building permit to be issued for such proposed construction, which shall require the dedication of such land and improvements to the City. The applicant for such building permits, if not the owner, shall notify the owner of the requirements to dedicate to the City such public improvements. The cost of any such improvements shall be borne by the owner, and the construction shall be subject to the provisions of all applicable City ordinances, resolutions, regulations and policies.

Failure to comply with the provisions for public improvements required by this Section shall be deemed a violation of the Building Code and shall constitute grounds for applicable penalties as provided in Titles IV and XII of the Pueblo Municipal Code and for revocation of any issued certificate of occupancy or temporary certificate of occupancy."

(h) Subsection R113.4 of the I.R.C., entitled "Violation penalties," is amended to read as follows:

"R113.4 Violation penalties. Any person, firm or corporation violating any of the provisions of this Code, upon conviction thereof, shall be punished as provided in Section 4-6-6 of the Pueblo Municipal Code. The application of any such penalty shall not be held to prevent the enforced removal of prohibited conditions."

(i) Subsection R301.2, entitled "Climatic and Geographic Design Criteria," is amended by the addition of Table R301.2(5), entitled "Pueblo County Ground Snow Loads," to read as follows:

"**Table R301.2(5) Pueblo County Snow Loads**

Elevation (asl)	Ground Snow Load (PSF)
5,300	20
5,550	23
5,800	25
6,050	27
6,300	30
6,550	33
6,800	35
7,050	38
7,300	40
7,550	41
7,800	43
8,050	44
8,300	45
8,550	46
8,800	48
9,050	49
9,300	50
9,550	51
9,800	52
10,050	54

10,300	55
10,550	56
10,800	58
11,050	59
11,300	60"

(j) Subsection R302.5.1, Opening protection, of the I.R.C., is amended by deleting the words "equipped with a self-closing or automatic closing device" at the end of the second sentence.

(k) Subsection R309.1 of the I.R.C., entitled "Floor surface", is amended by adding Exception 1 to read as follows:

Exception 1. The floor surface shall not be required to slope when the foundation is for enclosed non-habitable accessory structure.

(l) Subsection R311.3.2 of the I.R.C., entitled "Floor elevation at other exterior doors", Exception is amended to read as follows:

Exception: When more than two (2) rises are required, landing length at the exterior door may be reduced to eighteen inches (18") provided the door does not swing over stairs. Maximum height of landing shall not exceed thirty inches (30") above adjacent grade.

(m) Subsection R313.1 of the I.R.C., entitled "Townhouse automatic fire sprinkler systems," Exception is amended to read as follows:

Exception #1. An automatic sprinkler system shall not be required where additions or alterations are made to existing townhouses that do not have an automatic sprinkler system installed.

Exception #2. An automatic sprinkler system shall not be required with four or less attached dwelling units when separated in accordance with Section R302.2.2 item 2.

(n) Subsection R313.2 of the I.R.C., entitled "One- and two-family dwellings automatic fire systems," is deleted.

Subsections (a) through (n) of Section 4-6-2, containing amendments to the International Residential Code, remain unchanged and in full force and effect. The following subsections are repealed:

(o) **Reserved.** **[**Table R1102.1.2 (R402.1.2), entitled “Maximum Assembly U-Factors a and Fenestration Requirements” is amended to read as follows:

CLIMATE ZONE	FENESTRATION U-FACTOR f	SKYLIGHT U-FACTOR	GLAZED FENESTRATION SHGC d,e	CEILING U-FACTOR	WOOD FRAME WALL U-FACTOR	MASS WALL U-FACTOR b	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
5 and Marine 4	0.32 f	0.55	0.40	0.026	0.06	0.082	0.033	0.050	0.055

Footnotes:

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

b. Mass wall shall be in accordance with Section 402.2.5 where more than half of the insulation is on the interior, the mass wall U-factors shall not exceed 0.065 in Climate Zone 5 and Marine 4.

d. The SHGC column applies to all glazed fenestration.

f. A maximum U-factor of 0.32 shall apply in Climate Zone 5-8 to vertical fenestration products installed in buildings located above 4,000 feet in elevation above sea level.**]**

(p) **Reserved** **[**Table N1102.1.3 (R402.1.3), entitled "Insulation Minimum R-Values and Fenestration Requirements by Components" a is amended to read as follows:

CLIMATE ZONE	FENESTRATION U-FACTOR b, i	SKYLIGHT U-FACTOR	GLAZED FENESTRATION SHGC b,e	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE h	FLOOR R-VALUE	BASEMENT WALL R-VALUE c, g	SLAB R-VALUE & DEPTH d	CRAWL SPACE WALL R-VALUE c, g
5 and Marine 4	0.32 i	0.55	0.40	49	20 h or 13 + 5ci h	13/17	30	15ci or 19 or 13&5ci	10ci, 2 ft	15ci or 19 or 13&5ci

Footnotes:

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

b. The fenestration U-factor columns excludes skylights. The SHGC applies to all glazed fenestration.

c. "5ci or 13" means R-5 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "10ci or 13" means R-10 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "15ci or 19 or 13&5ci" means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation on the interior side of the wall; or R-13 cavity insulation on the interior of the wall in addition to R-5 continuous insulation on the interior or exterior surface of the wall.

d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs as indicated in the table. The slab-edge insulation for heated slabs shall not be required to extend below the slab.

g. The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, “13&5” means R-13 cavity insulation plus R-5 continuous insulation.

h. Mass walls shall be in accordance with Section R402.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.

i. A maximum U-factor of 0.32 shall apply in Climate Zones 3 through 8 to vertical fenestration products installed in buildings located above four thousand feet (4,000 ft) in elevation.**]**

(q) **Reserved** **[**Section N1104.1 (R404.1) of the I.R.C., entitled “Lighting equipment” is amended to read as follows:

“Not less than ninety [ninety] percent (90%) of all permanently installed lighting fixtures, excluding kitchen appliance lighting fixtures, shall contain high-efficiency lighting sources.”**]**

(r) Subsection M1305.1.3 of the I.R.C., entitled, "Appliances under floors," is amended by the addition of a sentence after the Exceptions which reads as follows:

"All access openings to underfloor furnaces shall be provided with a permanent ladder for equipment access."

(s) Subsection M1401.3 of the I.R.C., entitled, "Equipment and appliance sizing," is amended by adding a third exception which reads as follows:

"3. Additions that are 600 square feet or less."

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance to effectuate the policies and procedures described herein.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on_____

☐ Council action on _____failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

ORDINANCE NO.

AN ORDINANCE APPROVING AN ECONOMIC DEVELOPMENT AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION AND PUEBLO STEAM WORKS DBA SOUTHERN COLORADO SCIENCE CENTER DBA LEONARDO DA VINCI MUSEUM OF NORTH AMERICA, A COLORADO NONPROFIT CORPORATION AND AUTHORIZING THE MAYOR TO EXECUTE THE SAME; ESTABLISHING PROJECT NO. ED2602 - LEONARDO DA VINCI MUSEUM; AND BUDGETING AND APPROPRIATING $1,817,044 FROM THE UNENCUMBERED FUND BALANCE OF THE 1992-2031 SALES AND USE TAX CAPITAL IMPROVEMENT PROJECTS FUND TO PROJECT NO. ED2602 - LEONARDO DA VINCI MUSEUM

WHEREAS, the City collects a one-half-percent sales and use tax dedicated to primary-job-creating capital improvement projects within the City and the Pueblo Memorial Airport boundaries, with revenues deposited into the 1992-2031 Sales and Use Tax Capital Improvement Projects Fund (the "Fund"), most recently extended by voter-approved Ordinance No. 11001, effective November 5, 2025;

WHEREAS, the criteria, standards, and procedures for appropriation and expenditure of Fund revenues are codified in Chapter 4 of Title XIV of the Pueblo Municipal Code ("PMC"), as amended, including most recently by Ordinance No. 11125, effective February 24, 2026 (the "Criteria"); and

WHEREAS, on April 8, 2026, the Museum submitted an application to the City, which included a Project Narrative, a Strategic Business Plan dated July 31, 2024, and a Projected Economic Impact Analysis, requesting an economic development incentive in the amount of $1,817,044 from the Fund to assist with the completion of The Leonardo da Vinci Museum of North America; and

WHEREAS, the Museum will establish and operate an international destination-based cultural and educational attraction, producing immersive STEAM exhibits, interactive learning experiences, and year-round programming designed to attract local, regional, and out-of-state visitors along the Pueblo Riverwalk, neighboring businesses, general downtown area; and

WHEREAS, by Resolution No. 1 effective May 18, 2012, the Colorado Economic Development Commission approved the dedication of state sales tax increment revenue to the "Pueblo Professional Bull Riders University and Heritage of Heroes Project" under the Colorado Regional Tourism Act, C.R.S. §§ 24-46-301 *et seq.,* and the Museum is located within the Regional Tourisms Zone described in Exhibit A to said Resolution No. 1 and furthers the cultural tourism objectives of that Project, including the attraction of out-of-state visitors to downtown Pueblo and the Historic Arkansas Riverwalk; and

WHEREAS, City Council, having reviewed the Museum's application materials, finds under PMC § 14-4-85.3(b)(1) that the project described therein is not speculative and that the Museum has demonstrated the financial ability and experience necessary to complete and operate the project; and

WHEREAS, City Council finds under PMC § 14-4-85.3(b)(4) that the Museum's location and operations are consistent with the City's long-range planning by drawing visitors to the Pueblo Riverwalk corridor with a year-round cultural tourism attraction; and

WHEREAS, City Council finds the Museum will substantially benefit the public, become an economic driver for the community and region, and enhance the City's tax base warranting a variance to the requirements of section 14-4-85.3(b)(2); and

WHEREAS, City Council finds that the Museum does not substantially compete with any existing activity or business within the City because the international nature, breadth, and scope of this project is unlike and distinct from any other museum currently existing in Pueblo; and

WHEREAS, City Council finds, in its sole discretion under PMC § 14-4-85.3(c), that the creation by the Museum of twenty-five (25) new full-time-equivalent primary jobs at an average annual wage of $37,000 within the Regional Tourism Zone and which will substantially benefit the public, become an economic driver for the community and region, and enhance the City's tax base, justifies the expenditure of $932,044 which deviates from the limit otherwise applicable under PMC § 14-4-85.3(b)(2), and thus, grants a variance from PMC § 14-4-85.3(b)(2); and

WHEREAS, City Council further finds that the Museum falls within the definition of Place Making pursuant to PMC §14-4-85.1(6.5) and therefore, qualifies for funds pursuant to PMC §14-4-85.5(a)(1) and the amount of the incentive to be paid to the Museum will not exceed the fifteen percent (15%) aggregate annual cap set forth in PMC §14-4-85.3(b)(9); and

WHEREAS, while PMC § 14-4-85.3(b), § 14-4-85.3(c), and § 14-4-85.9(a) contemplate Council approval by resolution, approval of the underlying Agreement is required to be by ordinance under Charter § 3-9, and Council intends this Ordinance to constitute the approval contemplated by the foregoing PMC sections, having satisfied the procedural requirements of ordinance adoption.

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The Economic Development Agreement ("Agreement"), between the City of Pueblo, a Colorado municipal corporation, and Pueblo STEAM Works dba Southern Colorado Science Center dba Leonardo da Vinci Museum of North America, a Colorado nonprofit corporation, having been approved as to form by the City Attorney is hereby approved. The Mayor is authorized to execute and deliver the Agreement in the name of the City and the City Clerk is directed to affix the seal of the City thereto and attest same.

SECTION 2.

A variance from the requirements of PMC § 14-4-85.3(b)(2) is hereby granted in accordance with PMC § 14-4-85.3(c), on the grounds set forth in the recitals above, namely that the creation by the Museum of twenty-five (25) new full-time-equivalent primary jobs at an average annual wage of $37,000 within the Regional Tourism Zone and which will substantially benefit the public, become an economic driver for the community and region, and enhance the City's tax base, justifies the expenditure of $932,044 which deviates from the limit otherwise applicable under PMC § 14-4-85.3(b)(2).

SECTION 3.

Funds in the amount of One Million Eight Hundred Seventeen Thousand Forty-Four

Dollars ($1,817,044.00) are hereby budgeted and appropriated, and authorized to be transferred, expended, and made available out of the 1992-2031 Sales and Use Tax Capital Improvement Projects Fund for the purposes described in the Agreement, comprising $885,000 for Place Making and $932,044 for the Employment Incentive.

SECTION 4.

The officers and staff of the City are authorized and directed to perform any and all acts consistent with this Ordinance and the attached Agreement which are necessary or desirable to effectuate the transactions described therein.

SECTION 5.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____
_____
_____
_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____

City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Carla Sikes, City Attorney

SUBJECT: AN ORDINANCE APPROVING AN ECONOMIC DEVELOPMENT AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION AND PUEBLO STEAM WORKS DBA SOUTHERN COLORADO SCIENCE CENTER DBA LEONARDO DA VINCI MUSEUM OF NORTH AMERICA, A COLORADO NONPROFIT CORPORATION AND AUTHORIZING THE MAYOR TO EXECUTE THE SAME; ESTABLISHING PROJECT NO. ED2602 - LEONARDO DA VINCI MUSEUM; AND BUDGETING AND APPROPRIATING $1,817,044 FROM THE UNENCUMBERED FUND BALANCE OF THE 1992-2031 SALES AND USE TAX CAPITAL IMPROVEMENT PROJECTS FUND TO PROJECT NO. ED2602 - LEONARDO DA VINCI MUSEUM

SUMMARY:

Attached is an Ordinance approving an Economic Development Agreement between the City of Pueblo ("City") and Pueblo STEAM Works dba Southern Colorado Science Center dba Leonardo da Vinci Museum of North America ("Museum"), budgeting and appropriating $1,817,044 from the unencumbered fund balance of the 1992-2031 Sales and Use Tax Capital Improvement Projects Fund to Project No. ED2602 - Leonardo da Vinci Museum, and granting a variance under PMC § 14-4-85.3(c) from the funding limitation otherwise applicable under PMC § 14-4-85.3(b)(2).

PREVIOUS COUNCIL ACTION:

On February 24, 2025, City Council by Ordinance No. 10906 approved a Lease Agreement with the Museum which leases the patio area adjacent to the Pueblo Convention Center to the Museum for use as an outdoor café.

BACKGROUND:

The Museum has been working with the City, Pueblo Urban Renewal and other local partners over the last several years to bring the Leonardo da Vinci Museum to Pueblo.

The Museum will be the first and only permanent display of Leonardo da Vinci's art and machines in North America pursuant to a ten-year exclusivity agreement with the Artisans of Florence, Italy, who own the rights to the works. In addition, the Museum will house a STEAM Works interactive exhibit. The Museum has developed educational programs to supplement public and home-school curriculums on Fridays, weekends and school breaks.

The Museum is scheduled to open to the public this month. To date, the Museum has secured approximately $1.8 million in philanthropic investment to support development of the project, including planning, early infrastructure, programming, and exhibit design. The Economic Development Agreement proposed will support final-stage capital, operation, programmatic, and staffing investments necessary for a successful launch and long-term sustainability. Funds will be used for interior buildout of the café and gift shop, furnishings, technology and security systems, staffing, marketing, and expansion of the STEAM programming.

The Economic Development Agreement proposed provides for a total payment of $1,817,044. The total is broken down into two incentives. The first incentive in the amount of $885,000 is for Place Making as defined by Section 14-4-85.1(6.5). The second incentive is an Employment Incentive in the amount of $932,044 for the employment of twenty-five new primary jobs at an average annual wage of $37,000.

Because the Agreement's funding exceeds the limit in PMC § 14-4-85.3(b)(2), which caps City contributions at the lower of (a) 50% of committed annual gross salary for new employees or (b) 50% of project value as determined by Council in its sole discretion, the Ordinance grants a variance from § 14-4-85.3(b)(2) pursuant to PMC § 14-4-85.3(c). City Council determines that the project will create employment for new employees within the Colorado within and in furtherance of the Colorado Regional Tourism Act Project known as "Pueblo Professional Bull Riders University and Heritage of Heroes Project" and subject to Resolution No. 1 effective May 18, 2012, as amended to date. Thus, the variance is justified.

Further, the Museum will establish and operate an international destination-based cultural and educational attraction, producing immersive STEAM exhibits, interactive learning experiences, and year-round programming designed to attract local, regional, and out-of-state visitors along the Pueblo Riverwalk, neighboring businesses, and general downtown area. As such, the Museum will substantially benefit the public, become an economic driver for the community and region, and enhance the City's tax base.

FINANCIAL IMPLICATIONS:

If approved, the $1,817,044 will be paid out of the half cent sales tax fund. The $885,000 allocated for Place Making, together with all other Place Making, Economic Catalyst, and Economic Leakage expenditures within the calendar year 2026 today, will not exceed the fifteen percent (15%) aggregate annual cap set forth in Section 14-4-85.3(b)(9) of the Pueblo Municipal Code.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If this Ordinance is not approved, the Economic Development Agreement will not be approved.

RECOMMENDATION:

Approve the Ordinance.

ATTACHMENTS:

None

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Chris Noeller, Chief of Police

SUBJECT: AN ORDINANCE AMENDING SECTION 11-1-406 OF THE PUEBLO MUNICIPAL CODE TO CLASSIFY TRESPASS AND TO MAKE TRESPASS TO A DWELLING OR A VACANT BUILDING A CLASS 1 MUNICIPAL OFFENSE

SUMMARY:

This proposed Ordinance amends Section 11-1-406 of the Pueblo Municipal Code to classify the offense of trespass according to the type of premises entered. Trespass remains a Class 2 municipal offense in general, becomes a Class 1 municipal offense when the premises is a dwelling, and becomes a Class 1 municipal offense for which the penalty is limited to the maximum penalty for a petty offense under state law when the premises is a vacant building. The Ordinance also adds definitions of dwelling and vacant building and revises the definition of premises so that the enhanced classifications reach only unoccupied structures.

PREVIOUS COUNCIL ACTION:

None.

BACKGROUND:

This Ordinance is proposed at the request of the Mayor and the Police Chief in response to a recurring pattern of unauthorized entry into vacant structures within the City, which has been accompanied by an increase in fires and property damage to those structures. The Pueblo County Detention Center has agreed to accept the intake of arrestees charged with certain Class 1 municipal offenses, which makes a custodial enforcement response available where it previously was not.

Section 11-1-406 currently classifies all trespass as a Class 2 municipal offense. Under Section 11-1-103(c) of the Pueblo Municipal Code, a Class 2 municipal offense authorizes a fine but no term of imprisonment, and therefore does not support detention upon arrest. The proposed amendment replaces that single classification with

graduated classifications keyed to the type of premises entered.

The classifications are calibrated to comply with the Colorado Supreme Court's decision in In re People v. Camp; In re People v. Simons, 2025 CO 64 (Dec. 22, 2025), which holds that a home rule municipality may not impose a penalty exceeding the state penalty for the same conduct. Entry into a dwelling that is not inhabited or occupied corresponds to first degree criminal trespass, a class 1 misdemeanor under state law, so the Ordinance classifies that conduct as a Class 1 municipal offense, the maximum penalty for which is identical to the corresponding state penalty. Entry into a vacant building that is not a dwelling corresponds to second degree or third degree criminal trespass, both petty offenses, so the Ordinance limits the penalty for that conduct to the petty offense maximum of ten days imprisonment and a three hundred dollar fine. Entry into a dwelling that is inhabited or occupied remains a felony under state law within the jurisdiction of the district courts, and that conduct is excluded from the municipal offense.

FINANCIAL IMPLICATIONS:

There are no direct financial implications for the City arising from this Ordinance. Any detention of arrestees charged under the Ordinance would occur under the City's existing intake arrangement with the Pueblo County Detention Center.

BOARD/COMMISSION RECOMMENDATION:

Not applicable.

STAKEHOLDER PROCESS:

The proposed amendment was reviewed by the Pueblo Municipal Court and the City Attorney's Office.

ALTERNATIVES:

If this Ordinance is not approved, trespass will remain a Class 2 municipal offense in all cases. That classification authorizes a fine but no term of imprisonment, so the Police Department will continue to lack a custodial enforcement tool for trespass into dwellings and vacant buildings, and detention upon arrest will not be available for that conduct.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. Ordinance

ORDINANCE NO. _____

AN ORDINANCE AMENDING SECTION 11-1-406 OF THE PUEBLO MUNICIPAL CODE TO CLASSIFY TRESPASS AND TO MAKE TRESPASS TO A DWELLING OR A VACANT BUILDING A CLASS 1 MUNICIPAL OFFENSE

WHEREAS, the City of Pueblo is a home rule municipality organized and existing under Article XX of the Colorado Constitution, which vests in home rule municipalities plenary authority over matters of local concern, including the definition, classification, and punishment of municipal offenses; and

WHEREAS, the Pueblo Police Department has identified a recurring pattern of trespass into vacant buildings within the City of Pueblo that has been accompanied by an increase in fires and property damage to those buildings; and

WHEREAS, vacant buildings present a heightened risk of fire damage, structural collapse, and harm to first responders and adjacent property owners when unauthorized persons gain entry; and

WHEREAS, Section 11-1-406 of the Pueblo Municipal Code currently classifies all trespass as a Class 2 municipal offense, which under Section 11-1-103(c) of the Pueblo Municipal Code does not authorize a term of imprisonment and therefore does not permit detention upon arrest; and

WHEREAS, the Pueblo County Detention Center accepts intake of arrestees charged with Class 1 municipal offenses, which under Section 11-1-103(b) of the Pueblo Municipal Code authorizes imprisonment for not more than three hundred sixty-four (364) days; and

WHEREAS, Colorado law classifies the knowing and unlawful entry into a dwelling of another that is not inhabited or occupied as first degree criminal trespass under C.R.S. § 18-4-502(1)(a), a class 1 misdemeanor for which C.R.S. § 18-1.3-501(1)(a.5) authorizes a maximum penalty of three hundred sixty-four (364) days imprisonment and a fine of one thousand dollars ($1,000), classifies the unlawful entry upon other enclosed or posted premises as second degree or third degree criminal trespass under C.R.S. §§ 18-4-503 and 18-4-504, petty offenses for which C.R.S. § 18-1.3-503(1.5) authorizes a maximum penalty of ten (10) days imprisonment and a fine of three hundred dollars ($300), and classifies the entry into a dwelling that is inhabited or occupied as a class 6 felony under C.R.S. § 18-4-502(2)(a) within the jurisdiction of the district courts; and

WHEREAS, the Colorado Supreme Court held in *In re People v. Camp; In re People v. Simons*, 2025 CO 64 (Dec. 22, 2025), that when a municipal ordinance and a state statute prohibit identical conduct, the municipal penalties for such conduct may not exceed the corresponding state penalties the maximum penalty for a Class 1 municipal offense under Section 11-1-103(b) of the Pueblo Municipal Code is identical to the maximum penalty authorized for a class 1 misdemeanor under C.R.S. § 18-1.3-

501(1)(a.5), and the penalty for trespass to a vacant building is limited herein so as not to exceed the maximum penalty for the corresponding petty offense; and

WHEREAS, the City Council finds that classifying trespass to a dwelling and trespass to a vacant building as Class 1 municipal offenses, with the penalty for trespass to a vacant building limited as set forth herein, is necessary to give the Pueblo Police Department a custodial enforcement tool calibrated to the heightened public safety risk posed by unauthorized entry into vacant structures, to deter the conduct associated with fires and property damage to those structures, and that the penalties so authorized do not exceed the corresponding state penalties for the same conduct; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Section 11-1-406 of Chapter 1 of Title XI of the Pueblo Municipal Code is hereby amended to read as follows:

Sec. 11-1-406. - Trespass.

(a) It **[**is**]** **shall be** unlawful **[**and a Class 2 municipal offense**]** for any person to enter or remain upon the premises of another when consent to enter or remain is absent, denied or withdrawn by the owner, occupant or person having lawful control thereof.

(b) Trespass is:

(i) A Class 2 municipal offense if the premises is neither a dwelling nor a vacant building.

(ii) A Class 1 municipal offense if the premises is a dwelling.

(iii) A Class 1 municipal offense if the premises is a vacant building; provided, however, that the maximum penalty imposed for a violation of this subsection (b)(iii) shall not exceed the maximum penalty for a petty offense under C.R.S. § 18-1.3-503(1.5), or its successor provision.

(**[**b**]****c**) It shall be prima facie evidence that consent is absent, denied or withdrawn to enter or remain upon the premises of another when:

(1) Any person fails or refuses to remove himself or herself from said premises when requested to leave by the owner, occupant or person having lawful control thereof;

(2) Such premises are locked, boarded up or fenced or otherwise enclosed in a manner designed to exclude intruders; or

(3) Such premises are not open to the public and are posted with conspicuous signs that give notice that entrance therein is forbidden. Conspicuous signs means signs that are at least one (1) square foot in size and sufficiently lighted to be clear and visible and posted in a conspicuous location.

(**[**c**]****d**) For the purpose of this Section, premises means any privately or publicly owned real property, buildings, structures and other improvements thereon, but shall not include motor vehicles or **[**dwellings**]** **a dwelling that is inhabited or occupied at the time of the offense**.

(e) For the purpose of this Section, dwelling means a building which is used, intended to be used, or usually used by a person for habitation.

(f) For the purpose of this Section, vacant building means a building or structure, other than a dwelling, that is unoccupied for active business or other lawful use and that exhibits one or more of the following: (i) doors, windows, or other openings boarded, secured, or otherwise sealed to prevent entry; (ii) utilities disconnected at the meter; (iii) the building has been posted as vacant, condemned, dangerous, or unsafe by the City or by the owner or owner's agent; (iv) the building has been placarded by the Fire Department or the Building Official; or (v) the building has been continuously unoccupied for ninety (90) days or more.

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with this Ordinance to implement the policies and procedures described herein.

SECTION 3.

This Ordinance shall become effective immediately upon final passage and approval.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on_____

☐ Council action on _____failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Chris Noeller, Chief of Police

SUBJECT: AN ORDINANCE ESTABLISHING PROJECT NO. FF2601 (FEDERAL FORFEITURE EQUIPMENT), TRANSFERRING $136,000 FROM THE UNENCUMBERED FEDERAL FORFEITURE FUND BALANCE TO PROJECT FF2601 AND BUDGETING AND APPROPRIATING $136,000 FOR USE AND BENEFIT OF THE POLICE DEPARTMENT

SUMMARY:

The proposed ordinance will allow the Police Department to use $136,000 obtained from federal forfeitures to pay for the purchase of equipment that will be used by the Investigations Bureau. The first piece of equipment that will be purchased is a trailer that will be equipped to aid detectives in hazardous material responses stemming from narcotics laboratories. The second piece of equipment that will be purchased is a new pick-up truck that will be used to transport the trailer to scenes. The last piece of equipment that will be purchased is a set of temporary storage lockers that will be used for the safekeeping of cellular telephones that are being processed as evidence in criminal investigations. Other federal forfeiture funds are used to pay for Lexipol, Narcotics Section operating costs, software subscriptions, etc.

PREVIOUS COUNCIL ACTION:

On January 25, 2021, City Council approved Ordinance Number 9870 that provided for the use of $180,000 in federal forfeiture funds. Five years have passed since the last federal forfeiture disbursement and additional federal forfeiture funds have been paid to the City during that time.

BACKGROUND:

The funds in the federal forfeiture account are confiscated funds from drug arrests. Federal guidelines stipulate that these funds are to be used for the benefit of the Police Department. They can only be used to supplement the police budget, not supplant it. The City is in receipt of these funds.

FINANCIAL IMPLICATIONS:

The $136,000 will be used to pay for a hazardous materials response trailer, a new pick-up truck to pull the trailer, and storage lockers for cellular telephone evidence. Other federal forfeiture funds are used to pay for Lexipol, Narcotics Section operating costs, software subscriptions, etc., but are budgeted and appropriated through the annual operating budget ordinance.

BOARD/COMMISSION RECOMMENDATION:

Per the U.S. Department of Justice's *Guide to Equitable Sharing for State and Local Law Enforcement Agencies*, the local law enforcement agency is required to "establish an internal procedure to recommend expenditures from the revenue account. In many small agencies, the chief of police determines the purposes for which the funds are used. In larger agencies, committees have been formed to make recommendations for expenditures to the agency head. The agency head must authorize all expenditures from the federal sharing revenue account." Our Federal Forfeiture Committee is composed of the following members: City Council Representative, Council Member Selena Ruiz-Gomez, City Mayor, Heather Graham, Chief of Police, Chris Noeller, and District Attorney, Kala Beauvais. The committee met on May 26, 2026 and concurs on the expenditures outlined in the Ordinance.

STAKEHOLDER PROCESS:

Not Applicable.

ALTERNATIVES:

Council could decline to appropriate these funds, in which case the funds would remain in the Federal Forfeiture Account. However, the equipment needs identified by the Investigations Bureau would go unmet.

RECOMMENDATION:

Approval of the Ordinance.

Attachments: Federal Forfeiture Committee Meeting Minutes from the meeting held on May 26, 2026.

ATTACHMENTS:

1. Background -- 2026 Federal Forfeiture Project
2. Ordinance -- 2026 Federal Forfeiture Project
3. Federal Forfeiture Minutes (May 26, 2026)

ORDINANCE NO.

AN ORDINANCE ESTABLISHING PROJECT NO. FF2601 (FEDERAL FORFEITURE EQUIPMENT), TRANSFERRING $136,000 FROM THE UNENCUMBERED FEDERAL FORFEITURE FUND BALANCE TO PROJECT FF2601 AND BUDGETING AND APPROPRIATING $136,000 FOR USE AND BENEFIT OF THE POLICE DEPARTMENT

WHEREAS, funds are available in the Federal Forfeiture Account for the use and benefit of the Police Department; and

WHEREAS, the Police Department is in need of certain items to maintain the safety and efficiency of its officers; and

WHEREAS, the committee on disposition of forfeited property has approved such use of funds; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Funds in the total amount of $136,000 are hereby budgeted and appropriated out of the Federal Forfeiture Funds for the use and benefit of the Police Department.

SECTION 2.

Project No. FF2601 is hereby established and the amount of $136,000 is authorized to be expended therefrom.

SECTION 3.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance.

SECTION 4.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____
_____
_____
_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

City Clerk's Office Item #_____

Background Paper for Proposed
ORDINANCE

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Chief Chris Noeller – Police Department

SUBJECT: AN ORDINANCE ESTABLISHING PROJECT NO. FF2601 (FEDERAL FORFEITURE EQUIPMENT), TRANSFERRING $136,000 FROM THE UNENCUMBERED FEDERAL FORFEITURE FUND BALANCE TO PROJECT FF2601 AND BUDGETING AND APPROPRIATING $136,000 FOR USE AND BENEFIT OF THE POLICE DEPARTMENT

SUMMARY:

The proposed ordinance will allow the Police Department to use $136,000 obtained from federal forfeitures to pay for the purchase of equipment that will be used by the Investigations Bureau. The first piece of equipment that will be purchased is a trailer that will be equipped to aid detectives in hazardous material responses stemming from narcotics laboratories. The second piece of equipment that will be purchased is a new pick-up truck that will be used to transport the trailer to scenes. The last piece of equipment that will be purchased is a set of temporary storage lockers that will be used for the safekeeping of cellular telephones that are being processed as evidence in criminal investigations. Other federal forfeiture funds are used to pay for Lexipol, Narcotics Section operating costs, software subscriptions, etc.

PREVIOUS COUNCIL ACTION:

On January 25, 2021, City Council approved Ordinance Number 9870 that provided for the use of $180,000 in federal forfeiture funds. Five years have passed since the last federal forfeiture disbursement and additional federal forfeiture funds have been paid to the City during that time.

BACKGROUND:

The funds in the federal forfeiture account are confiscated funds from drug arrests. Federal guidelines stipulate that these funds are to be used for the benefit of the Police

Department. They can only be used to supplement the police budget, not supplant it. The City is in receipt of these funds.

FINANCIAL IMPLICATIONS:

The $136,000 will be used to pay for a hazardous materials response trailer, a new pick-up truck to pull the trailer, and storage lockers for cellular telephone evidence. Other federal forfeiture funds are used to pay for Lexipol, Narcotics Section operating costs, software subscriptions, etc., but are budgeted and appropriated through the annual operating budget ordinance.

BOARD/COMMISSION RECOMMENDATION:

Per the U.S. Department of Justice's *Guide to Equitable Sharing for State and Local Law Enforcement Agencies*, the local law enforcement agency is required to "establish an internal procedure to recommend expenditures from the revenue account. In many small agencies, the chief of police determines the purposes for which the funds are used. In larger agencies, committees have been formed to make recommendations for expenditures to the agency head. The agency head must authorize all expenditures from the federal sharing revenue account." Our Federal Forfeiture Committee is composed of the following members: City Council Representative, Council Member Selena Ruiz-Gomez, City Mayor, Heather Graham, Chief of Police, Chris Noeller, and District Attorney, Kala Beauvais. The committee met on May 26, 2026 and concurs on the expenditures outlined in the Ordinance.

STAKEHOLDER PROCESS:

Not Applicable.

ALTERNATIVES:

Council could decline to appropriate these funds, in which case the funds would remain in the Federal Forfeiture Account. However, the equipment needs identified by the Investigations Bureau would go unmet.

RECOMMENDATION:

Approval of the Ordinance.

Attachments: **Federal Forfeiture Committee Meeting Minutes from the meeting held on May 26, 2026**

ORDINANCE NO. _____

AN ORDINANCE ESTABLISHING PROJECT NO. FF2601 (FEDERAL FORFEITURE EQUIPMENT), TRANSFERRING $136,000 FROM THE UNENCUMBERED FEDERAL FORFEITURE FUND BALANCE TO PROJECT FF2601 AND BUDGETING AND APPROPRIATING $136,000 FOR USE AND BENEFIT OF THE POLICE DEPARTMENT

WHEREAS, funds are available in the Federal Forfeiture Account for the use and benefit of the Police Department; and

WHEREAS, the Police Department is in need of certain items to maintain the safety and efficiency of its officers; and

WHEREAS, the committee on disposition of forfeited property has approved such use of funds; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Funds in the total amount of $136,000 are hereby budgeted and appropriated out of the Federal Forfeiture Fund for the use and benefit of the Police Department.

SECTION 2.

Project No. FF2601 is hereby established and the amount of $136,000 is authorized to be expended therefrom.

SECTION 3:

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance.

SECTION 4.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on_____

☐ Council action on _____failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

FEDERAL FORFEITURE COMMITTEE MEETING MINUTES
MAY 26, 2026
12:00pm

A meeting of the Federal Forfeiture Committee was conducted via a ZOOM conference call at 12:00 pm on Tuesday, May 26, 2026. The meeting was called to approve a budget to utilize Federal Forfeiture funds by the Pueblo Police Department.

PRESENT: Kala Beauvais, District Attorney; Selena Ruiz-Gomez, City Council Representative; Heather Graham, City Mayor; Chris Noeller, Chief of Police; Kenny Rider, Deputy Chief of Police Investigations Bureau; Capt. Gabe Maldonado, Special Investigations; Sgt. Joe Cardona, Criminal Investigations; Micaela Leffler, Police Department Crime Analyst; and Alisa Boerhave, Police Administrative Tech. The voting members in attendance are the Pueblo District Attorney, the Pueblo City Council Representative, the Pueblo City Mayor, and the Chief of Police.

Deputy Chief Rider welcomed everyone and explained our last Federal Forfeiture Committee Meeting was on December 28, 2020. The Police Department has not requested use of the Federal Forfeiture funds since then. The minutes from the 2020 meeting were sent to everyone. However, this last meeting was almost six years ago and we have a completely new Federal Forfeiture Committee, so Deputy Chief Rider will not ask for approval of those minutes from December 28, 2020. Deputy Chief Rider stated that the funds allocated in the 2020 meeting for the Glock handguns have all been spent.

Deputy Chief Rider explained a background and ordinance has already been prepared for the use of these Federal Forfeiture funds. Finance has reviewed and approved the ordinance and provided a project number. There is currently $773,036.43 in the Federal Forfeiture account. We are requesting to spend $136,000 for one project that has two sub-projects. Deputy Chief Rider has requested Capt. Maldonado and Sgt. Cardona to be present to explain the two sub-projects.

The first part of the project is for $120,000 in Special Investigations. Capt. Gabe Maldonado will explain the reason and costs. Capt. Maldonado explained he took over Special Investigation in Aug 2025. We have been involved in some multi-agency operations and have discovered some deficiencies in our vehicles inventory. We have a 2013 Dodge Ram that requires a new engine; a 2006 Ford Freestar that has been out of service for some time; and a 1991 Ford Ambulance that we used for hazmat clean up. The ambulance is operational but has limited range and multiple leaks. We also have six (6) undercover vehicles that do not have lights and sirens. We cannot use the undercover vehicles in a proactive manner.

Having a truck and trailer instead of the ambulance would work better. We can use the truck for daily operations and use the trailer when hazmat cleanup is required. Fentanyl (hazmat) cleanup has become more common. We can outfit the trailer with cabinets, storage containers and other necessary equipment. We will also need lights and sirens for the undercover vehicles. A couple months back, Tom Cummings found a 4x4 F150 Supercab for $45,000. That cost made have changed in the past few months. Capt. Maldonado asked if anyone had any questions. None were posed.

Sgt. Joe Cardona of Criminal Investigations explained the second part of the project. Lately we have discovered some issues with our discovery process. We need to acquire some

cabinets/lockers for evidence storage. Sgt. Cardona explained the process of cell phone evidence. We seize a cell phone for evidence and place it in a static shield bag. We then have to get a warrant before processing the cell phone. This can cause problems with the evidence. We need to block any form of connection to the cell phone so that remote alterations can't be made to the cell phone. We currently do not have enough bags to cover the amount of cell phones coming in for processing. This exposes the Police Dept to vulnerability in the chain-of-evidence process. We need to acquire a "block box lab" that will block all radio frequencies to the cell phone or laptop.

We would like to get two (2) "Locker Blockers" to prevent this remote access to modify the cell phone content. We would also like to get more Faraday bags, which are evidence bags to store cell phones/laptops. Having these items will insure a continuous loop of evidence from the crime scene to the discovery process.

Deputy Chief Rider said the quote for the Locker Blocks and Faraday bags is $15,732.23. We are asking for $16,000 in case costs increased since the quote was made. The $120,000 for Special Investigations and $16,000 for Criminal Investigations is how we reach the $136,000 we are requesting from the Federal Forfeiture funds.

Deputy Chief Rider asked if anyone had any questions. District Attorney Beauvais asked how many phones can fit in a locker. Sgt. Cardona explained that seven (7) phones can go into each locker. One of the lockers would be in evidence for officers to place seized phones. The other locker will be in the digital forensic lab where Sgt. Cardona can process the phone. Sometimes it can take years to gain access to a cell phone. District Attorney Beauvais asked if two (2) lockers will be enough. Sgt. Cardona thinks two (2) is good.

Councilwoman Selena Ruiz-Gomez asked where these Federal Forfeiture funds come from. Chief Noeller explained that they come from Narcotic trafficking cases and Task Force seizures in drug cases. This does not come from the General fund. Deputy Chief Rider explained that Finance keeps these funds in a separate account.

Deputy Chief Rider asked if there were any further questions. None were posed.

District Attorney Beauvais made the motion to approve the use of the Federal Forfeiture funds and Mayor Graham seconded. The motioned was approved unanimously.

The meeting was adjourned at 12:16pm. The next meeting date and time have yet to be determined and will be announced.

Alisa Boerhave

Alisa Boerhave
Administrative Tech
Pueblo Police Department

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Andrew Hayes, Public Works Director

SUBJECT: AN ORDINANCE TRANSFERRING, BUDGETING AND APPROPRIATING INSURANCE PROCEEDS IN THE AMOUNT OF $444,857 INTO CAPITAL PROJECT NO. CI2513 - ICE ARENA ROOF REPAIR CIRSA, AWARDING A CONSTRUCTION CONTRACT IN THE AMOUNT OF $369,857.00 TO L.E. ROOFING, LLC, FOR ACCOUNT PROJECT NO. 26-023 ROOF RETROFIT PROJECT - PUEBLO ICE ARENA, SETTING FORTH $75,000.00 FOR CONTINGENCIES, AND AUTHORIZING THE PURCHASING AGENT TO EXECUTE SAME

SUMMARY:

This Ordinance transfers, budgets and appropriates insurance proceeds in the amount of $444,857.00 into Capital Project No. CI2513 - Ice Arena Roof Repair CIRSA, and awards a construction contract in the amount of $369,857.00 to L.E. Roofing, Inc, for Account Project No. 26-023 Roof Retrofit Project - Pueblo Ice Arena and sets forth $75,000.00 for contingencies.

PREVIOUS COUNCIL ACTION:

None.

BACKGROUND:

This project will consist of retrofitting the existing roof at the Pueblo Ice Arena.

The roof on the Ice Arena has sustained hail impact damage requiring replacement.

Based on the City of Pueblo's adopted 2021 Codes, Secton 705.2.1 of the IEBC, Sections 1512.2.1 and 1512.2.1.1 of the IBC and Section 503.1.1 of the IECC all allow for a recover of the existing roof system.

Any remaining funds will be transferred back into the self-insurance fund.

FINANCIAL IMPLICATIONS:

Funds in the amount of $444,857.00 will be transferred, budgeted and appropriated from insurance proceeds to Capital Project No. CI2513.

Funding in the amount of $444,857.00 for contract and contingencies shall be paid from CI2513.

BOARD/COMMISSION RECOMMENDATION:

None.

STAKEHOLDER PROCESS:

None.

ALTERNATIVES:

Denial of this Ordinance will cancel the project.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. 26-023 Updated Bid Summary

ORDINANCE NO.

AN ORDINANCE TRANSFERRING, BUDGETING AND APPROPRIATING INSURANCE PROCEEDS IN THE AMOUNT OF $444,857 INTO CAPITAL PROJECT NO. CI2513 - ICE ARENA ROOF REPAIR CIRSA, AWARDING A CONSTRUCTION CONTRACT IN THE AMOUNT OF $369,857.00 TO L.E. ROOFING, LLC, FOR ACCOUNT PROJECT NO. 26-023 ROOF RETROFIT PROJECT - PUEBLO ICE ARENA, SETTING FORTH $75,000.00 FOR CONTINGENCIES, AND AUTHORIZING THE PURCHASING AGENT TO EXECUTE SAME

WHEREAS, on June 21, 2023, the Pueblo Ice Arena building experienced damage from a major hailstorm; and

WHEREAS, the City will receive proceeds from the insurance company for the costs of repairing such damage; and

WHEREAS, competitive bids for Account Project No. 26-023 Roof Retrofit Project - Pueblo Ice Arena project have been received and examined; and

WHEREAS, the proposal of L.E. Roofing, Inc., was the lowest of those bids determined to be responsive, and the Committee of Awards recommends to the City Council that it authorize Account Project No. 26-023 Roof Retrofit Project - Pueblo Ice Arena Project to be performed; NOW THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Upon receipt, insurance proceeds in the amount of $444,857.00 shall be budgeted, appropriated, and transferred into Capital Project No. CI2513 - Ice Arena Roof Repair CIRSA from the Self Insurance Fund

SECTION 2.

The City Council authorizes Account Project No. 26-023 Roof Retrofit Project - Pueblo Ice Arena Project, to be performed, and the contract for said project is hereby awarded to L.E. Roofing, Inc., in the amount of $369,857.00.

SECTION 3.

In addition to the amount of the bid set forth, as aforementioned, an additional amount as stipulated in this section is hereby established for contingencies and additional work.

Contingencies and Additional Work…….$75,000.00

SECTION 4.

The Purchasing Agent is hereby authorized to execute said contract on behalf of the City of Pueblo, a Colorado Municipal Corporation, and the City Clerk shall affix the seal of the City thereto and attest same.

SECTION 5.

Funds for Account Project No. 26-023 in the amount of $444,857.00 shall be from Capital Project No. CI2513 - Ice Arena Roof Repair CIRSA.

SECTION 6.

The officers of the City are authorized to perform any and all acts consistent with this Ordinance to implement the policies and procedures described herein.

SECTION 7.

This Ordinance shall become effective immediately upon passage and approval.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____
_____
_____
_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

City Clerk

City of Pueblo
Purchasing
Teresa May Burns, Director
230 S. Mechanic St., Pueblo, CO 81003

UPDATED EVALUATION TABULATION

IFB No. 26-023

Roof Retrofit Project - Pueblo Ice Arena

RESPONSE DEADLINE: April 29, 2026 at 10:00 am

Report Generated: Tuesday, May 5, 2026

SELECTED VENDOR TOTALS

Vendor	Total
L.E. ROOFING LLC	$369,857.00
Colorado Front Range Roofing	$385,693.77
Central States Roofing Company	$523,967.00
Monument Roofing of Colorado a Tecta America Company, LLC	$554,194.00
Colorado Moisture Control, Inc.	$608,260.00
Trafton Roofing	$644,399.00
Superior Roofing, Inc.	$651,445.00
7 Summits Roofing	$666,963.00

Note: 1 bidder has been excluded as non-responsive

Base Bid - Thermoplastic Membrane Roof System				7 Summits Roofing	Central States Roofing Company	Colorado Front Range Roofing	Colorado Moisture Control, Inc.	L.E. ROOFING LLC	Monument Roofing of Colorado a Tecta America Company, LLC	Superior Roofing, Inc.	Trafton Roofing
Line Item	Description	Quantity	Unit of Measure	Total	Total	Total	Total	Total	Total	Total	Total
1	Install New Thermoplastic Membrane Roof System	1	Lump Sum	$666,963.00	$523,967.00	$385,693.77	$608,260.00	$369,857.00	$554,194.00	$651,445.00	$644,399.00
Total				$666,963.00	$523,967.00	$385,693.77	$608,260.00	$369,857.00	$554,194.00	$651,445.00	$644,399.00

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Beritt Odom, Director Planning and Community Development

SUBJECT: AN ORDINANCE DESIGNATING 515 W NORTHERN AVE, IANNE'S PIZZERIA, AS A LOCAL HISTORIC LANDMARK

SUMMARY:

The applicant is requesting to designate 515 W Northern Ave, Ianne's Pizzeria, as a local landmark.

PREVIOUS COUNCIL ACTION:

None.

BACKGROUND:

The property owners of 515 W. Northern Ave., the site of Ianne's Pizzeria, are requesting the designation of their property as a Local Historic Landmark. Their application narrative proposes that the site is eligible to be designated as a landmark under criteria 1A, Special historic interest or importance, more specifically, Iane's Pizza has significant character, interest, or value as part of the development, heritage, or cultural characteristics of the City. In summary, the application claims that the pizzeria was the first to introduce pizza to Pueblo and that it was one of the first to utilize the "take-out" restaurant structure. The pizzeria is located in the Bessemer neighborhood, and the application cites that it served workers from the nearby CF&I Steel Mill, neighborhood residents, and the surrounding Pueblo community. It also notes that the restaurant has been owned by three generations of the Ianne family since its inception in 1945 under its original name, the Bessemer Drive-In.

FINANCIAL IMPLICATIONS:

None.

BOARD/COMMISSION RECOMMENDATION:

The Historic Preservation Commission, at their April 15, 2026 Regular Meeting, voted 7-0 to recommend approval.

The Planning and Zoning Commission, at their May 13, 2026 Regular Meeting, voted 7-0 to recommend approval.

STAKEHOLDER PROCESS:

The application was reviewed at a public hearing held by the Pueblo Historic Preservation Commission on April 15, 2026. The hearing was noticed in the Pueblo Chieftain and a public notice poster was displayed on the site 14 days before the hearing date.

The application was also reviewed by the City of Pueblo Planning and Zoning Commission at their May 13, 2026 meeting.

ALTERNATIVES:

If City Council does not approve this Ordinance, 515 W Northern Ave will not be designated as a Local Historic Landmark.

Upon request of City Council, the Ordinance could be returned to the Historic Preservation Commission and the Planning and Zoning Commission for consideration of proposed modifications.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. HPC-26-01 Attachments

ORDINANCE NO.

AN ORDINANCE DESIGNATING 515 W NORTHERN AVE, IANNE'S PIZZERIA, AS A LOCAL HISTORIC LANDMARK

WHEREAS, the City of Pueblo's Historic Preservation Code, Chapter 14, Title IV, states that the City shall identify, designate, and preserve those buildings, objects, monuments, structures and sites which reflect outstanding elements of the community's architectural and cultural heritage; and,

WHEREAS, the present application was initiated by the applicant, Wendy Raso, and the City's Historic Preservation Commission has reviewed the application for designation of 515 W Northern Ave, Ianne's Pizzeria, as a Local Historic Landmark and has recommended to the Planning and Zoning Commission the designation of this resource; and,

WHEREAS, the City Planning and Zoning Commission has reviewed the Historic Preservation Commission's recommendation and the designation application and submitted its recommendation for the landmark designation to Council; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The City Council finds and determines that 515 W Northern Ave, Pueblo, Colorado, has special historic importance as part of the development, heritage, and culture of Pueblo, thus qualifying under landmark criteria 1A as defined in the Pueblo Historic Preservation Code Section 4-14-8.

SECTION 2.

The City Council hereby designates 515 W Northern Ave, Ianne's Pizzeria, as a local Pueblo Historic Landmark, subject to the benefits, obligations, and restrictions resulting from such designation as described in Chapter 14, Title IV of the Pueblo Municipal Code.

SECTION 3.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of the Ordinance to implement the policies and procedures described herein

SECTION 4.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____
_____
_____
_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Mike Castellucci
Chair

Patrick Avalos
Vice Chair

Brett Boston
City Council Representative

city of PUEBLO colorado
Planning & Zoning Commission

Alexandra Aznar

Samuel Hernandez Jr.

Cheryl Spinuzzi

James Salazar

P&Z Referral on HPC-26-01

May 13, 2026

TO:	City of Pueblo Planning and Zoning Commission
FROM:	Mikaylin Hackley, Planner
THROUGH:	Beritt Odom, Director of Planning and Community Development
SUBJECT:	Local Landmark Designation of 515 W. Northern Ave.
APPLICANT:	Wendy Raso
PROPERTY OWNER:	WHR Properties LLC
LOCATION:	515 W. Northern Ave., Pueblo, CO 81004

EXPLANATION OF REQUEST:

Per Sec. 4-14-8 of the Municipal Code, the Planning and Zoning Commission reviews local landmark designations with specific consideration for "any comprehensive plan, zoning requirements, projected public improvements, and existing and proposed renewal and development plans applicable to the section of the City to be affected by the designation or amendment of a designation."

The Historic Preservation Commission recommended 7-0 to approve this nomination of a local historic landmark at their regular April 15, 2026 meeting based on criteria 1A of the local landmarking criteria, determining that the site has distinctive character and special historic importance to Pueblo's cultural, social, and commercial history.

APPLICABLE STANDARDS PER PMC SEC. 4-14-8:

"(g) Within fifteen (15) days after making a recommendation to approve, HPC shall transmit its written recommendation to the Planning and Zoning Commission including the findings of fact which constitute the basis for HPC recommendation. The Planning and Zoning Commission shall without public hearing review HPC's recommendation and the designation application at its next available meeting and submit its recommendations thereon to Council. All recommendations of the Planning and Zoning Commission shall be made taking into consideration any ***comprehensive plan, zoning requirements, projected public improvements, and existing and proposed renewal and development plans*** applicable to the section of the City to be affected by the designation or amendment of a designation."

Comprehensive Plan

Ianne's Pizzeria is designated as Neighborhood Mixed-Use by the 2022 Pueblo Regional Comprehensive Plan. According to the Comp Plan, Neighborhood Mixed-Use areas should accommodate small-scale retail activity and local businesses. Ianne's Pizzeria is a small-scale neighborhood restaurant that has served the community for approximately 81 years. Therefore, Ianne's conforms with the Neighborhood Mixed-Use Future Land Use Designation.

Additionally, the Regional Goals and Policies section of the Comprehensive Plan addresses historic preservation efforts in the City. Policy 4.1.3, Inventory of Cultural Resources, encourages the expansion of the Pueblo Inventory of Cultural Resources, and the measurer of success on page 54 encourages an increasing trend in local landmarks. Thus, landmarking Ianne's Pizzeria directly addresses this policy in the Pueblo Regional Comprehensive Plan with respect to planning and historic preservation.

Zoning Requirements

The subject property is located in a Central Business (B-4) Zone District. Restaurants are a use-by-right in B-4 zone districts, and the stated purpose of the B-4 district is "to provide areas for the location of business and other central services required by the region at large." Thus, landmarking the site as a commercial restaurant is compliant with the B-4 Zone District.

Projected Public Improvements

No current public improvement plans would be prevented by the landmarking of this property. If designated, the site would be regulated by the Historic Preservation Commission Standards of Appropriateness and Demolition Standards and Title 4 of the Pueblo Municipal Code. This means that any extensive remodeling of the exterior of the building would require a Certificate of Appropriateness, and the site could not be demolished without a Certificate of Demolition, both issued by the Historic Preservation Commission.

Existing or Proposed Renewal and Development Plans

The site is located in the Colorado Smelter Urban Renewal Project Area.

COMMISSION ACTION:

If the Planning and Zoning Commission makes the necessary findings as described in Sec. 4-14-8 of the Pueblo Municipal code, a recommendation of approval should be forwarded to City Council for final approval of the Local Landmark designation.

ATTACHMENTS:

A. HPC-26-01 Packet (as presented to Historic Preservation Commission)
B. HPC Minutes from April 15, 2026

Anthony Perko
Chair

Jan Schraner
Vice Chair

Sandra Morrison
Secretary

city of PUEBLO colorado
Historic Preservation Commission

George Koncilja

Mark Guerrero

Guy Chabot

Christina Trujillo

HPC-26-01

April 15, 2026

TO:	City of Pueblo Historic Preservation Commission
FROM:	Mikaylin Hackley, Planner
THROUGH:	Beritt Odom, Director of Planning and Community Development
SUBJECT:	Local Landmark Designation of 515 W. Northern Ave.
APPLICANT:	Wendy Raso
PROPERTY OWNER:	WHR Properties LLC
LOCATION:	515 W. Northern Ave., Pueblo, CO 81004

EXPLANATION OF REQUEST:

The property owners of 515 W. Northern Ave., the site of Ianne's Pizzeria, are requesting the designation of their property as a Local Historic Landmark. Their application narrative proposes that the site is eligible to be designated as a landmark under criteria 1A cited below. In summary, the application claims that the pizzeria was the first to introduce pizza to Pueblo and that it was one of the first to utilize the "take-out" restaurant structure. The pizzeria is located in the Bessemer neighborhood, and the application notes that it served workers from the nearby CF&I Steel Mill, neighborhood residents, and the surrounding Pueblo community. It also notes that the restaurant has been owned by three generations of the Ianne family since its inception in 1945 under its original name, the Bessemer Drive-In. Thus, the application asserts, the site meets the criteria of 1A for having distinctive character and special historic importance to Pueblo's cultural, social, and commercial history.

APPLICABLE STANDARDS PER PMC SEC. 4-14-8:

(a) A building, object, monument, structure, or site may individually be designated as a Landmark … if they have distinctive character and have:

1) Special historic or prehistoric interest or importance:

- **a. has significant character, interest, or value, as part of the development, heritage, or cultural characteristics of the City,** State or Nation; or is associated with the life of a person significant in the past; or
- b. is the site of a historic event with a significant effect upon society; or
- c. exemplifies the cultural heritage of the community; or has yielded, or may be likely to yield, important prehistoric information.

2) Special architectural, engineering or aesthetic interest or importance:

- a. portrays the environment in an era of history characterized by a distinctive architectural style; or
- b. embodies those distinguishing characteristics of an architectural-type or engineering specimen; or

c. is the work of a designer whose individual work has significantly influenced the development of the City; or
d. contains elements of design, detail, materials or craftsmanship which represent a significant innovation.

3) Special geographic interest or importance:
a. by being part of or related to a square, park or other distinctive area, which should be developed or preserved according to a plan based on a historic, cultural or architectural motif, or
b. owing to its unique location or singular physical characteristic, represents an established and familiar visual feature of the neighborhood, community, or City.

COMMISSION ACTION:

If the Historic Preservation Commission finds that the property meets the eligibility criteria 1A as described in Sec. 4-14-8 of the Pueblo Municipal code and presented in the Narrative Details, a recommendation of approval should be forwarded to the Planning and Zoning Commission for review and recommendation to City Council for final approval of the Local Landmark designation.

ATTACHMENTS:

A. Landmark Application
   1. Narrative Details
   2. Statement of Significance
   3. Research Sources
B. Public Notice photo
C. Site photos

Narrative Details:

Ianne's Pizzeria is eligible for local historic designation according to Pueblo's Historic Preservation Code Section 1A that states, "A building, object, structure or monument…has significant character, interest or value as part of the development, heritage, or cultural characteristics of the City, State or Nation due to its strong association of Pueblo's cultural, social, and commercial history."

Building specifics, 515 W. Northern Avenue:

Built in 1945 specifically for the purpose of a commercial enterprise, the 123-foot by 55-foot, one story structure consists of a kitchen, dining room, storage facilities, office, walk in refrigerator and freezer, and an asphalt parking lot along the south side of the structure adjacent to Northern Avenue.

Composed of a brick and cinderblock interior and exterior with vertical wooden siding along the front facade, Ianne's Pizzeria style of architecture is commonly found in commercial mid-century commercial buildings. "Lacking a comprehensive historical and architectural survey of Pueblo's modern resources, it is difficult to make definitive comments regarding how widespread the use of such materials was in the city at the time of construction. However, casual observation indicates Pueblo defied national trends, with most local architects and contractors favoring more traditional materials for buildings constructed between 1940 and 1982 rather than glass, steel or plastic." The building is set on 0.2 acres. The main building was added onto in 1957 and again in 1962. Although there have been some design updates to the interior, there have been no other major exterior architectural changes to the structure in more than 60 years.

There is no known architect, however, according to the current owner, many historic features within the structure remainincluding a Hobart Dough Mixer, the original mixer used by staff in 1954. The bar, stainless steel food preparation tables and walk in refrigerator and freezer were installed during the 1962 addition.

Business history and significance:

Established in 1945 by Tony and Helen Ianne, the Bessemer Drive Inn, began making and serving quickly prepared hamburgers and Italian sausage sandwiches to hungry workers from the nearby CF&I Steel Mill, neighborhood residents, and the surrounding Pueblo community making use of a radical new dining method sweeping the United States: placing the food order at a window letting the cooks know directly what food was desired rather than with a server who would then relay the message. A short time later, a server would deliver the food to the customer and it would be eaten quickly in the car rather than inside a building.

"Located along major streets, these eateries featured large parking lots designed to hold multiple cars at a time. Early (drive-in) restaurants were often small, flat-roofed, with large windows and a walk-up counter where customers could order from a relatively limited menu. Over time these facilities increasingly adopted the exaggerated roof shapes associated with Googie style architecture. Many drive-in restaurants also introduced car service, allowing diners to order from either a carhop (often on roller skates) or via a car-side speaker. All restaurants had highly visible, often neon, signage."

By decade's end, Puebloans supported nine "drive-in restaurants." One of these, The Bessemer Drive Inn, fed hundreds of hungry Puebloans from a menu consisting of hamburgers, French fries, milkshakes, Italian sausage sandwiches, fried chicken and hot dogs. With recipes reflecting local food preferences such as spicy chile peppers and Colorado raised beef, the drive in became quite profitable.

A decade later, the Ianne family, with its proud Italian roots, expanded the menu providing the first pizza menu option in Pueblo and contributed to the post–World War II evolution of ethnic dining cuisine.

Although its origins can be traced to 17th century Naples, pizza as we know it today was brought to America by Italian immigrants in the 1890s. Ingredients such as tomatoes, basil and oregano were rarely used in the Western United States except by those of Italian heritage. By the mid-1940s, veterans returning to American soil who had savored the flavors of Italy wished to revisit the combination of ingredients associated with pizza including oregano, pepperoni, basil and mozzerella cheese. Restaurateurs like the Ianne family, met the demand that quickly spread across the country.

Because many Puebloans (minus those with Italian lineage) lacked knowledge of the cheese and bready concoction, Tony and Helen would sit outside of the restaurant giving away pizza slices away as a tactical gimmick. Marketing it as "tomato pie" to those who might not understand the concept, the quick to prepare and cook food eaten with your hands proved a hit and was added to the permanent menu. The restaurant was renamed Ianne's Pizzeria in 1955 to reflect the change and the popularity of the new item on the menu.

To keep pricing affordable, the Ianne family supported other local businesses to supply the restaurant with necessary ingredients, including ground beef and pork from Franks Meat Market, hamburger buns from Schuster's Banquet Bakery and chile peppers from Mauro Farms. In 1963, pricing for a hamburger $0.37, the equivalent in 2026 of $4.16. (when adjusted for inflation.)

Continuing to keep up trends, the restaurant building physically expanded in 1957 with an addition known as the HiFi Club built on the southwest corner of the original building structure.Marketed to college students and young adults as a social club, advertising often revolved around entertainment, listening to live and recorded popular music and studying, marketing the opportunity to "study to stereophonic stimulation."

To the east of the original kitchen, "The Factory" was constructed in 1962 in which Ianne's staff made pizzas to sell to grocery stores in the frozen food section. Family memory recalls that, "(I remember) a food inspector was onsite every day as they made the pizza to sell and distribute as frozen pizzas. The idea did not take off. Can you believe it? They did not make money on that venture and eventually closed The Factory." The walk-in freezer and refrigerator installed at the time of The Factory remains and is currently used to house restaurant ingredients.

In 1970, the HiFi Club dissolved and Pinocchio's opened in its predecessor's footprint. Also marketed as a young person's social club, Pinocchio's sold 3.2% beer. Ianne's food was passed through a window in the kitchen and sold to customers enjoying the crowds of Pinocchio's. Afterwards, the space opened as The Wiz, an arcade-focused business, but closed by mid-decade.

For decades, Ianne's specialized in "take out" food either eaten in the car or taken home to eat. After retirement, Ianne's daughter and son-in-law, Rose Marie and William Nekola, became the owners and transformed the former night club space in the 1990s to a dining room while continuing to maintain the take-out operation.

For more than eight decades, the restaurant has operated continuously in the same building. Now in its third generation of ownership, the family continues to use original family recipes. As Brett Mohar, manager and great grandson of Tony and Helen, was quoted in a *Pueblo Chieftain* newspaper article in 2022, "what makes it so special is if you ordered a pizza 70 years ago and then came in today, it would taste exactly the same."

The continued operation of the business by multiple generations of the Ianne family illustrates the role of family-owned enterprises in shaping Pueblo's identity and maintaining continuity within the Bessemer neighborhood. Together, these associations establish the property's historic significance as a longstanding cultural landmark within the City of Pueblo.

Statement of Significance
In a summary paragraph, please explain, concisely, how the place is historically significant.

Founded in 1945 by Tony and Helen Ianne as the Bessemer Drive In, what is now known as Ianne's Pizzeria was the first restaurant to introduce pizza to the citizens of Pueblo. The restaurant continues to be owned and managed by the founder's descendants at its original site, is also among one of Colorado's oldest pizzerias. As a long standing cultural and culinary landmark, Ianne's Pizzeria has served generations of Puebloans reflecting our city's working-class heritage and the post-World War II evolution of local dining culture.

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- Pitts, Gail. "All in the Family: Local Mexican and Italian Fares Keep Puebloans Coming Back for More." *Pueblo Chieftain*, November 27, 1994
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- US Inflation Calculator Inflation Calculator | Find US Dollar's Value From 1913-2026. Accessed March 16, 2026
- Walker, Peter. "A Pizza History" *Pueblo Chieftain.*September 29, 2003

Research Sources:

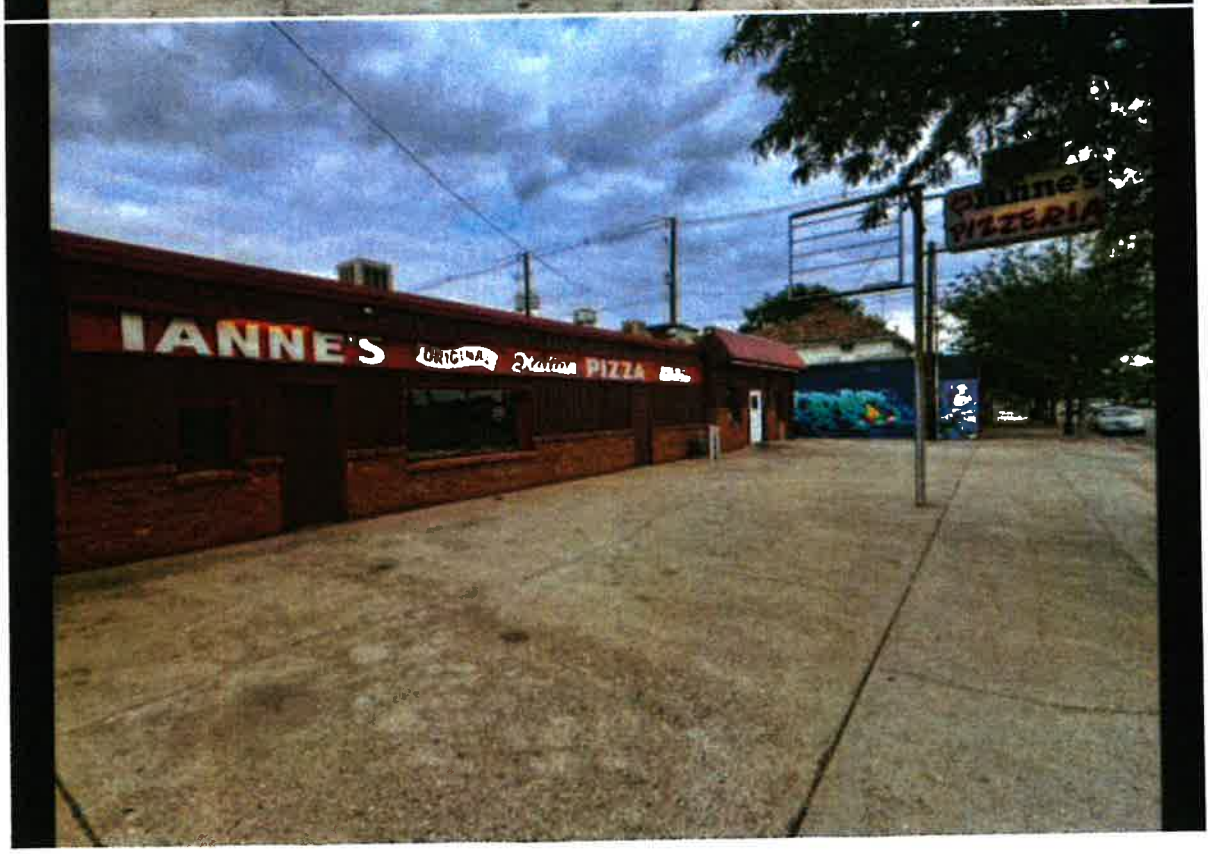
- Anstey, Mary-Therese, Yost, Cheri, Thomas, Adam. *In Pursuit of the American Dream: Pueblo in the Modern Age 1945-1982*: (Denver: Historitecture, LLC), August 2012.
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- Ianne family archives. Personal interviews, photographs, family lore, and email correspondence provided by Wendy Raso and Brett Mohar, February 9- March 14, 2026.
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Exhibits B&C

Photos provided by applicant




OUT


IANNE'S
Italian PIZZA
PIZZERIA

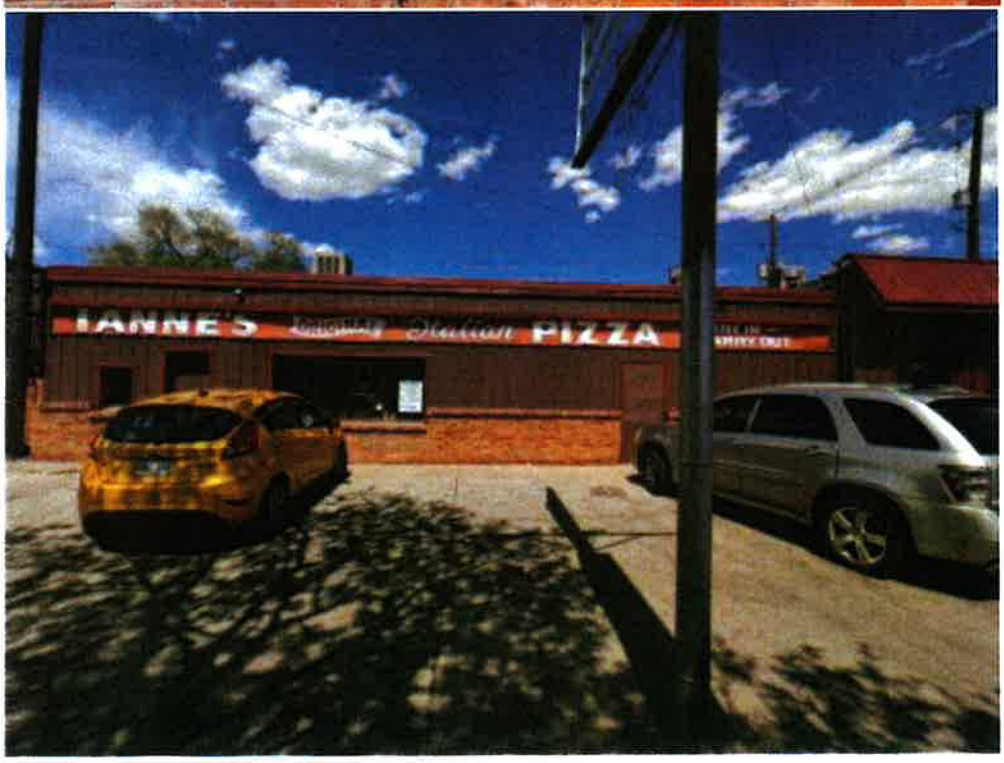

Lifestyle
When
pizza
came to Pueblo

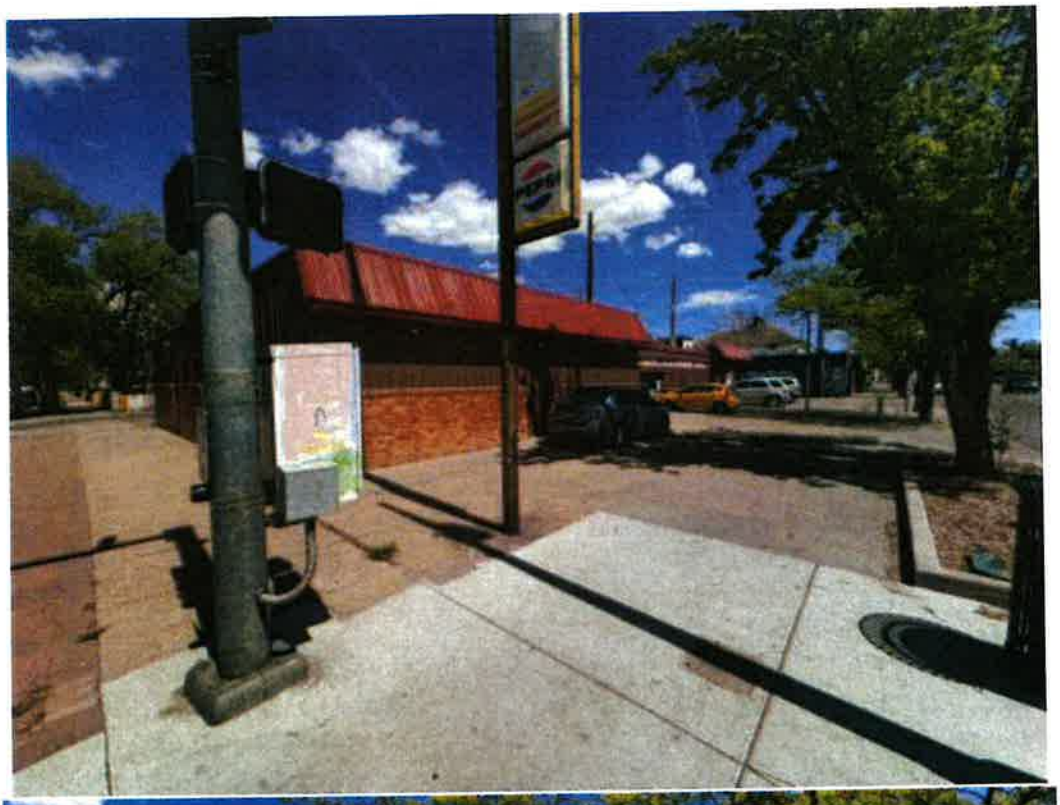

Pueblo - Bessemer
Ianne's pizzas, grinders
are Bessemer traditions

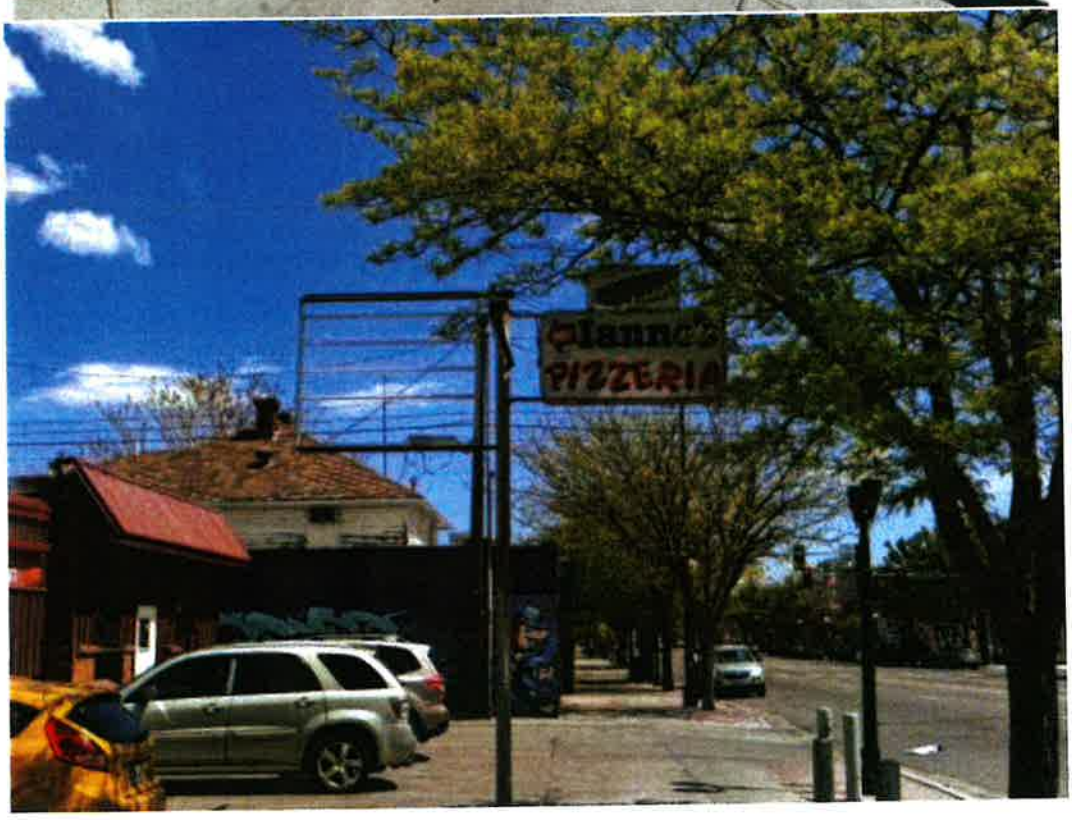

THROWBACK
TO 1963
PIZZAS
13"
IANNE'S MENU
SANDWICHES
PIZZAS
9"
ALL PRICES INCLUDE TAX
METRO
A pizza history

Staff photos
April 9, 2026








PIZZERIA

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Beritt Odom, Director Planning and Community Development

SUBJECT: AN ORDINANCE AMENDING ZONING RESTRICTIONS TO REZONE 4.7-ACRES LOCATED AT 3210 W. 31ST ST. FROM AGRICULTURAL (A-1) TO MULTIPLE RESIDENTIAL AND OFFICE (R-5) ZONE DISTRICT

SUMMARY:

Rezone 4.7-acres located at 3210 W. 31st St. from Agricultural (A-1) to Multiple Residential and Office (R-5) Zone District

PREVIOUS COUNCIL ACTION:

None.

BACKGROUND:

The applicant is requesting to rezone the subject property, 3210 W. 31st St., from an Agricultural (A-1) to Multiple Residential and Office (R-5) Zone District. The subject property is just east of N. Pueblo Blvd. and is currently an undeveloped lot. The subject property was annexed into the city in November of 2021 and rezoned Agricultural (A-1) as an interim zoning classification until the time of development, as allowed by the approved Annexation Agreement (A-21-01). In December of 2021 the property was subdivided into two lots, a 13.85-acre lot to facilitate Phase I of the Pueblo Springs Apartments, and a 4.7-acre lot for Phase II of the Pueblo Springs Apartments. Phase I of the apartments was completed in December 2025. The applicant now intends to build Phase II of the Pueblo Springs Apartments on the property, requiring a rezoning to do so.

The area is designated as Urban Residential Future Land Use Category, which allows for garden apartments along collector and arterial roads. The proposed Pueblo Springs Apartments are situated at the southeast corner of W. Pueblo Boulevard, an expressway, and W. 31st St., a collector, and are three stories with ample outdoor recreation amenities. Phase II of the Pueblo Springs Apartments will provide 113

dwelling units within six three-story buildings. The immediate area is now home to several large multifamily developments, Phase I of the Pueblo Springs Apartments, a senior living community, and a market rate apartment complex. The adjacent properties to the south and east are all vacant land and as such there is no negative impact to surrounding residential neighborhoods. The R-5 Zoning and apartment complex are well situated for direct access to Pueblo Boulevard and Highway 50.

FINANCIAL IMPLICATIONS:

There are no financial implications for the City.

BOARD/COMMISSION RECOMMENDATION:

The Planning and Zoning Commission, at their May 13, 2026, Regular Meeting, voted 7-0 to recommend approval.

STAKEHOLDER PROCESS:

The Planning Department sent out Notice of the Planning and Zoning Commission Public Hearing to all property owners located within 300 feet of the subject property.

A Public Notice poster was placed on the subject property 15 days prior to the Public Hearing.

ALTERNATIVES:

If City Council does not approve this Ordinance the property will not be rezoned in accordance with the Pueblo Municipal Code.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. Z-26-03 Attachments

ORDINANCE NO.

AN ORDINANCE AMENDING ZONING RESTRICTIONS TO REZONE 4.7-ACRES LOCATED AT 3210 W. 31ST ST. FROM AGRICULTURAL (A-1) TO MULTIPLE RESIDENTIAL AND OFFICE (R-5) ZONE DISTRICT

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The zoning restrictions covering the following described property, and in addition half of all adjacent dedicated roadway and alley rights-of-way, together generally identified in the attached Rezone Exhibit, is hereby changed from Agricultural (A-1) to Multiple Residential and Office (R-5) Zone District:

LOT 2 BLK 1 PUEBLO SPRINGS APARTMENTS SUBDIVISION

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of the Ordinance to implement the policies and procedures described herein.

SECTION 3.

This Ordinance shall become effective immediately upon final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

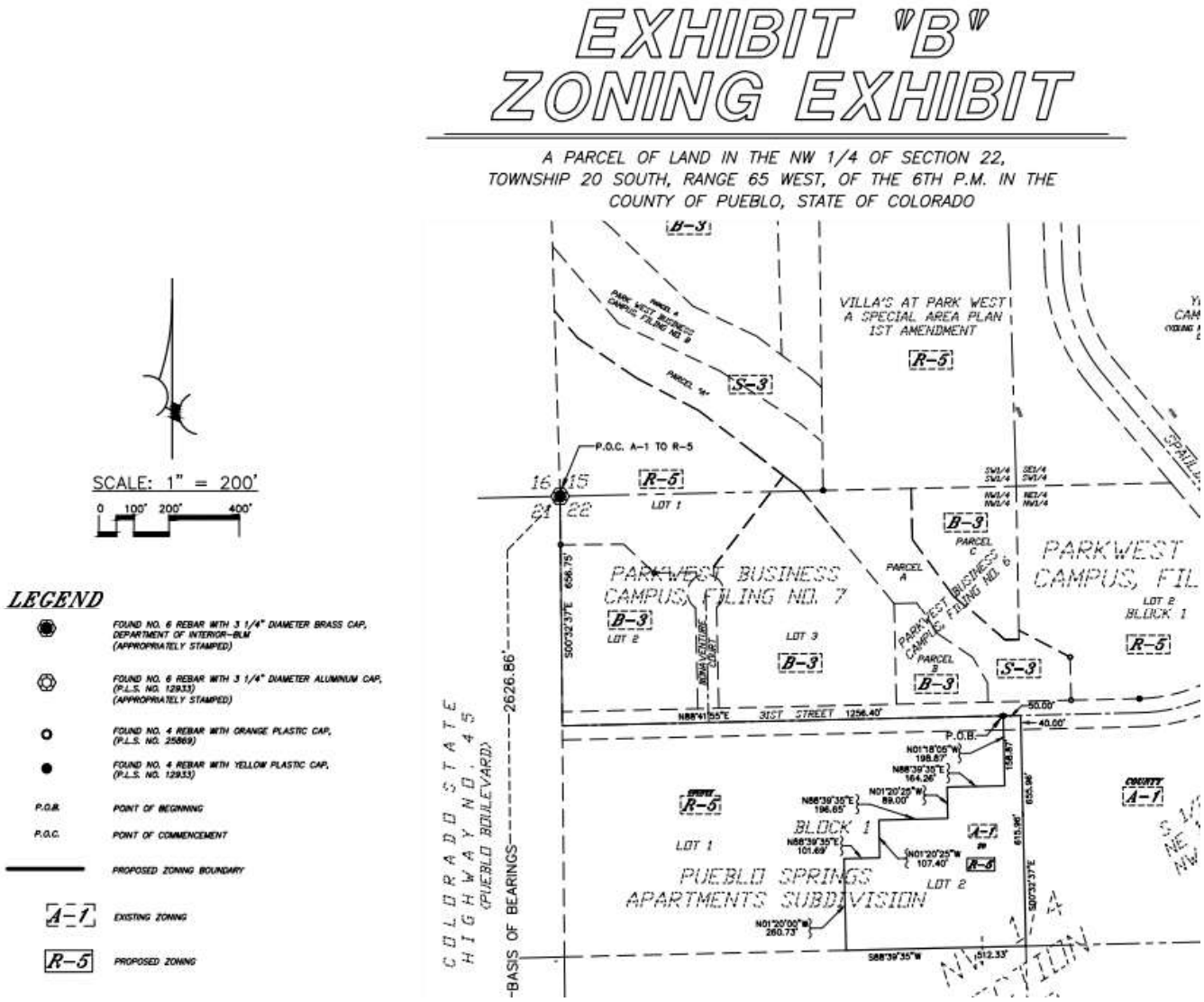
☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

E. Zoning Exhibit of the Subject Property, 3210 W. 31st St.



F. Application

Mike Castellucci
Chair

Patrick Avalos
Vice Chair

Brett Boston
City Council Representative

city of PUEBLO colorado
Planning & Zoning Commission

Alexandra Aznar

Elizabeth Bailey

Cheryl Spinuzzi

James Salazar

MINUTES OF REGULAR MEETING

City of Pueblo, Colorado
Wednesday, May 13, 2026, 3:30 p.m.
City Council Chambers, 1 City Hall Place

The meeting was called to order at 3:31 pm. with Castellucci presiding.

Commissioners Present: Brett Boston, Mike Castellucci, Patrick Avalos, Alexandra Aznar, Elizabeth Bailey, Cheryl Spinuzzi, and James Salazar.

Commissioners Absent: N/A

Staff Members Present*:* Laura Portis, Assistant City Attorney; Beritt Odom, Director of Planning and Community Development; Mikaylin Hackley, Planner; Riane Ledford, Planner; and Cindy Capritta, Land Use Technician.

Staff Members Absent: N/A

Approval of the Agenda: Bailey moved to approve the agenda, seconded by Boston.

Motion Passed: 7-0.

Public Meeting: **HPC-26-01 Historic Landmarking:** A review of the nomination for a local landmark designation of Ianne's Pizzeria located at 515 W Northern Ave. Staff Report by Mikaylin Hackley, Planner

Commission Action: Bailey moved to recommend the Landmark application be forward to City Council second by Avalos.

Motion Passed: 7-0

Public Hearing:

Z-26-03 Rezone: A rezoning of 4.7-acres located at 3210 W. 31st St. from Agricultural (A-1) to Multiple Residential and Office (R-5) Zone District. Staff Report by Riane Ledford, Planner.

Hearing: Applicant Mike Cuppy, NorthStar Engineering was sworn in and spoke in support of the application. No one appeared in opposition.

Commission Action: Bailey moved to recommend the rezone application be forward to City Council, seconded by Salazar.

Motion Passed: 7-0

Mike Castellucci
Chair

Patrick Avalos
Vice Chair

Brett Boston
City Council Representative

city of PUEBLO colorado
Planning & Zoning Commission

Alexandra Aznar

Elizabeth Bailey

Cheryl Spinuzzi

James Salazar

Z-26-03

TO:	City of Pueblo, Planning and Zoning Commission
FROM:	Riane Ledford, Planner
THROUGH:	Beritt Odom, Director of Planning and Community Development
DATE:	May 13th, 2026
SUBJECT:	Rezone from Agricultural (A-1) to Multiple Residential and Office (R-5) Zone District
APPLICANT:	Nick Krasovic
PROPERTY OWNER:	Emery S. Chukly, Pueblo Springs Apartments LLC.
LOCATION:	3210 W. 31st St. Pueblo, CO. 81008
CONCURRENT REQUESTS:	N/A

REQUEST:
Rezone 4.7-acres located at 3210 W. 31st St. from Agricultural (A-1) to Multiple Residential and Office (R-5) Zone District.

BACKGROUND AND ANALYSIS:

The applicant is requesting to rezone the subject property, 3210 W. 31st St., from an Agricultural (A-1) to Multiple Residential and Office (R-5) Zone District. The subject property is just east of N. Pueblo Blvd. and is currently an undeveloped lot. The subject property was annexed into the city in November of 2021 and rezoned Agricultural (A-1) as an interim zoning classification until the time of development, as allowed by the approved Annexation Agreement (A-21-01). In December of 2021 the property was subdivided into two lots, a 13.85-acre lot to facilitate Phase I of the Pueblo Springs Apartments, and a 4.7-acre lot for Phase II of the Pueblo Springs Apartments. Phase I of the apartments was completed in December 2025. The applicant now intends to build Phase II of the Pueblo Springs Apartments on the property, requiring a rezoning to do so.

The area is designated as Urban Residential Future Land Use Category, which allows for garden apartments (low-rise apartment structures) along collector and arterial roads. The proposed Pueblo Springs Apartments are situated at the southeast corner of W. Pueblo Boulevard, an expressway, and W. 31st St., a collector, and are three stories with ample outdoor recreation amenities. Phase II of the Pueblo Springs Apartments will provide 113 apartment units. The site plan provided shows six three-story buildings for the second phase The apartment complex also has a clubhouse, pool, and walking trails. The immediate area is now home to several large multifamily developments, Phase I of the Pueblo Springs Apartments, a senior living community, and a market rate apartment complex. The adjacent properties to the south and east are all vacant land and as such there is no

negative impact to surrounding residential neighborhoods. The R-5 Zoning and apartment complex are well situated for direct access to Pueblo Boulevard and Highway 50 and easy access to the south, east, and west and keeping high density uses directly along major arterials that can reduce neighborhood congestion.

LAND USE AND PLANNING COMMENTS
CHARACTER AND COMPATIBILITY

Site Character: The subject property is currently undeveloped.

Neighborhood Compatibility:

North	Multiple Residential and Office (R-5) Zone District; Pueblo Springs Apartments
East	County Zoning; Undeveloped land
South	County Zoning; Undeveloped land
West	Multiple Residential and Office (R-5) Zone District; Pueblo Springs Apartments

Comprehensive Plan Compliance: The project site is designated by the Pueblo Comprehensive Plan as "Urban Residential." The Pueblo Comprehensive Plan designation of *Urban Residential* area states neighborhoods are found predominantly within the city limits of Pueblo and the urbanizing areas in the City's immediate periphery. These neighborhoods have a mixture of housing types and neighborhood commercial services. The Comprehensive Plan states further that "zoning for duplexes, garden apartments and small office buildings may be allowed along collector and arterial roads." The proposed rezoning site is located east of N. Pueblo Boulevard, which is an expressway and south of W. 31st Street, which is a Collector Road, meeting the criteria for multifamily residential development within the Urban Residential land use designation. The proposed (R-5), Multiple-Residential and Office District is in conformance with the actual development of the immediate area and in conformance with the Comprehensive plan.

ZONING AMENDMENT TEST

The standard for accepting an amendment to the zoning map is that the proposed zoning action must either:

1) Further the goals and objectives of the comprehensive land use plan, or

❑ Comments **The Comprehensive Plan 2022 designates the subject property as Urban Neighborhood. The rezoning request furthers the comprehensive plan as it allows for multifamily housing.**

2) Show that the area has changed significantly since the adoption of the comprehensive land use plan

❑ Comments **Not Applicable**

3) Show that there was a mistake or error made in the original zoning of the property.

❑ Comments **Not Applicable**

APPLICATION REQUIREMENT PER §17-6-1 OF THE PUEBLO MUNICIPAL CODE

The applicant's name and address and the name and address of any person, firm or corporation represented by such applicant in the application

❑ Comments **The application contains the required information.**

The interest of the applicant and the interest of the person, firm or corporation represented by the applicant, be it legal, sales development, operation, or other interest.

❑ Comments **The application contains the required information.**

The nature of the amendment and a legal description of the property that would be affected by the amendment.

❑ Comments **The application contains the required information.**

A statement of the facts which the applicant believes justify the amendment; provided; however, that when any amendment changing the zoning map is requested, the following additional information shall be furnished:

❑ Comments **The application contains the required information.**

A general description of the proposed development to the distance which will be affected; such description including subjects of environmental effect, economic effect, and traffic effect, if any; and such description carried out in scope and detail to the extent needed to support the requested amendment and as may be required by the Planning and Zoning Commission.

❑ Comments **The applicant proposes implementing Phase II of the Pueblo Springs Apartments, a new apartment use.**

A tentative site plan showing proposed structures, uses, open spaces, facilities for parking and loading and arrangements for pedestrian and vehicular circulation.

❑ Comments **A site plan is attached to the staff report.**

A statement of the proposed time schedule for beginning and completion of development.

❑ Comments **The applicant is estimating that the proposed project will begin in December 2026 and be completed November 2028.**

A statement reasonably indicating the applicant's economic responsibility and capability of accomplishing the development for which a zoning amendment is requested.

❑ Comments **“The applicant acknowledges the economic responsibility and has the capability of accomplishing the development for which the zoning amendment is requested”**

CONTEXT OF ZONE DISTRICT REQUIREMENTS PER §17-4-51(16) OF THE PMC:

Multiple Residential and Office (R-5) Zone District Standards:
The standards of the Multiple Residential and Office (R-5) Zone District are designed to retain and provide areas of high-density multifamily dwelling unit structures with limited commingling of professional offices and studios.

RECOMMENDED ACTION:
If the Planning and Zoning Commission makes the necessary findings, a recommendation to City Council for **approval** of the rezone request is appropriate.

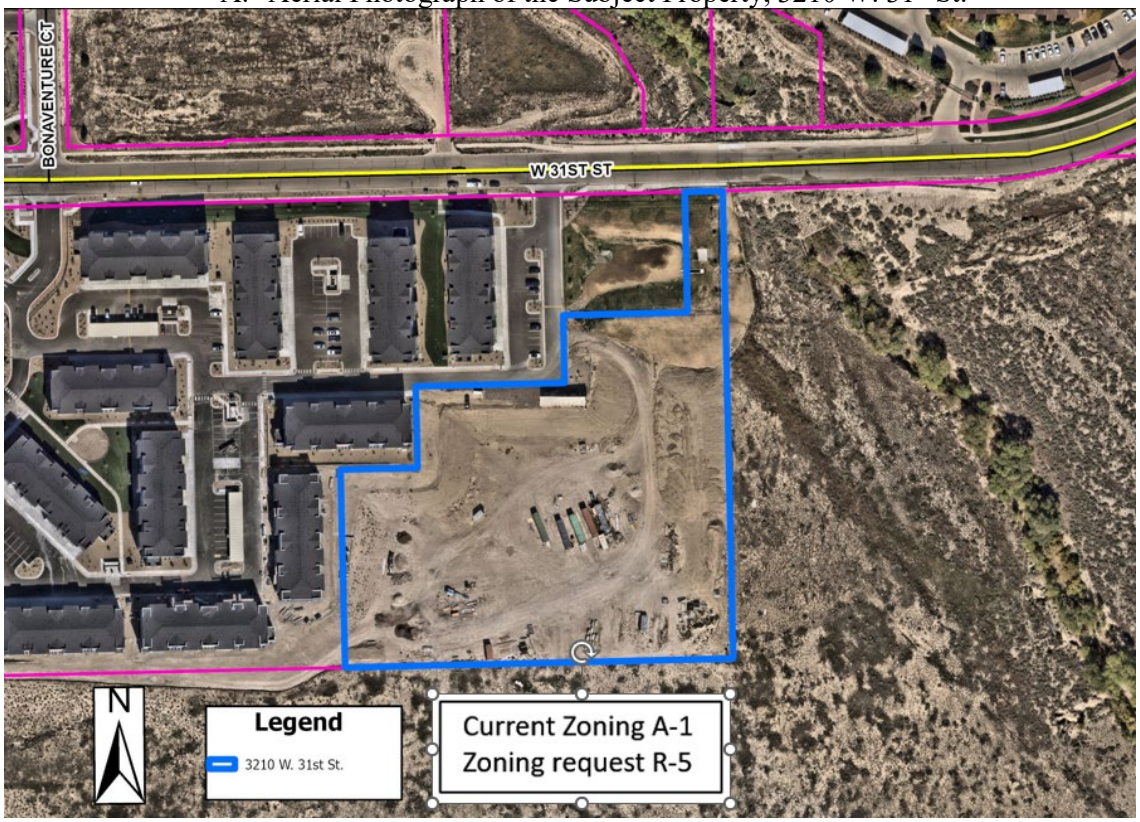
REFERRAL AGENCIES AND COMMENTS:

- City Public Works- No Comment
- City Transportation- No Comment.
- City Law Department- No Comment
- Pueblo Regional Building Department- No Comment.
- City Fire Department- No Comment.
- City Wastewater- No Comment
- City Stormwater-No comment
- City Parks and Recreation Department- No Comment
- Xcel Energy- No Comment
- Black Hills Energy- No Comment
- CDOT- See Attached CDOT Memo

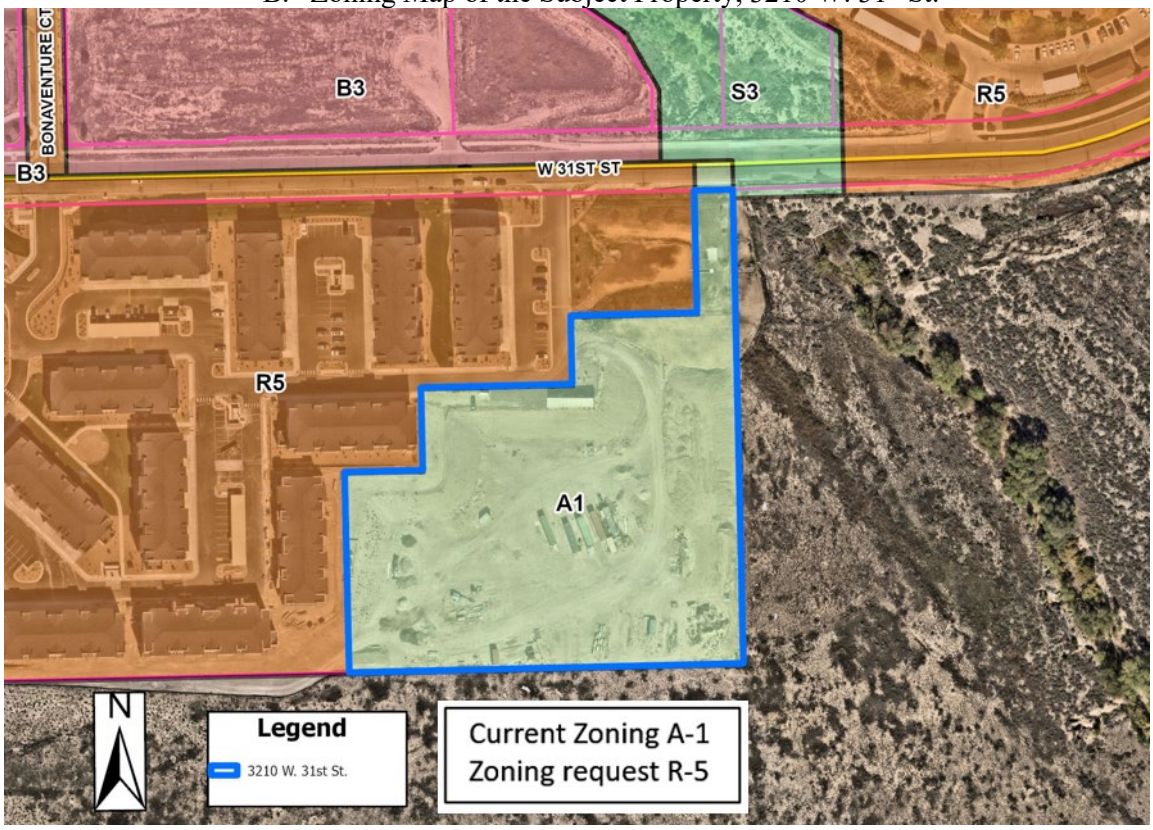
ATTACHMENTS:

A. Aerial Photograph
B. Zoning Map
C. Comprehensive Plan Map
D. Site Photographs
E. Zoning Exhibit
F. Application

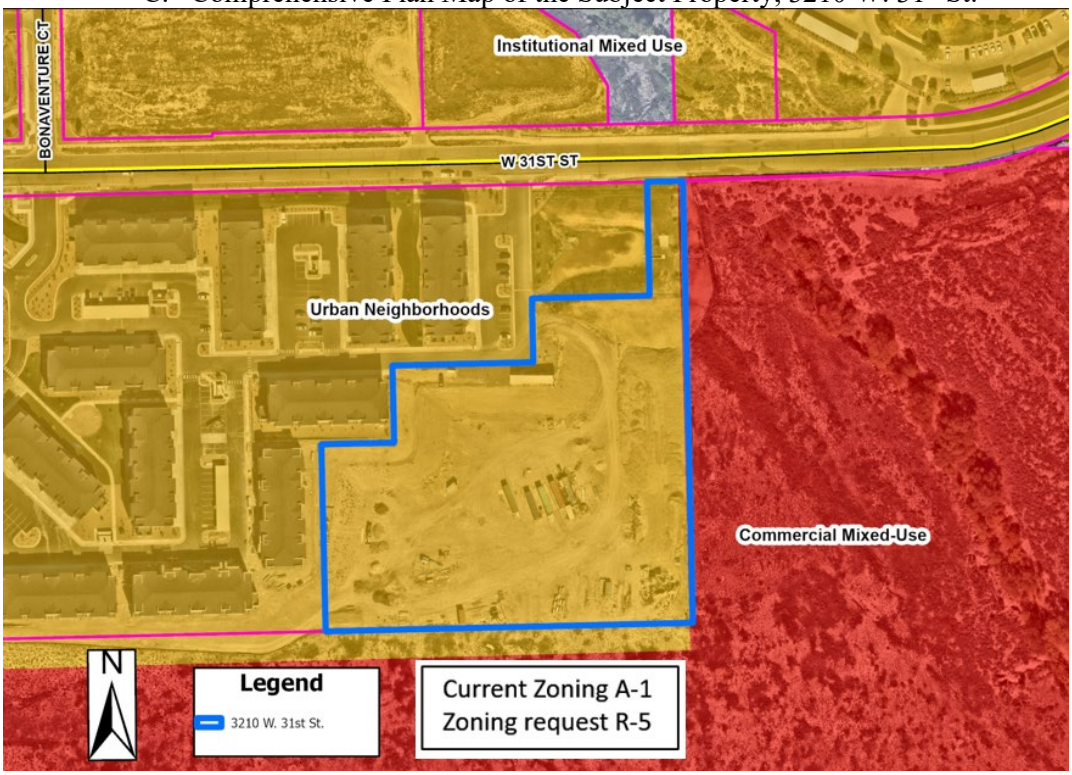
A. Aerial Photograph of the Subject Property, 3210 W. 31st St.



B. Zoning Map of the Subject Property, 3210 W. 31st St.



C. Comprehensive Plan Map of the Subject Property, 3210 W. 31st St.



D. Site Photos, Public Notice







EXHIBIT "B"
ZONING EXHIBIT

A PARCEL OF LAND IN THE NW 1/4 OF SECTION 22, TOWNSHIP 20 SOUTH, RANGE 65 WEST, OF THE 6TH P.M. IN THE COUNTY OF PUEBLO, STATE OF COLORADO

SCALE: 1" = 200'

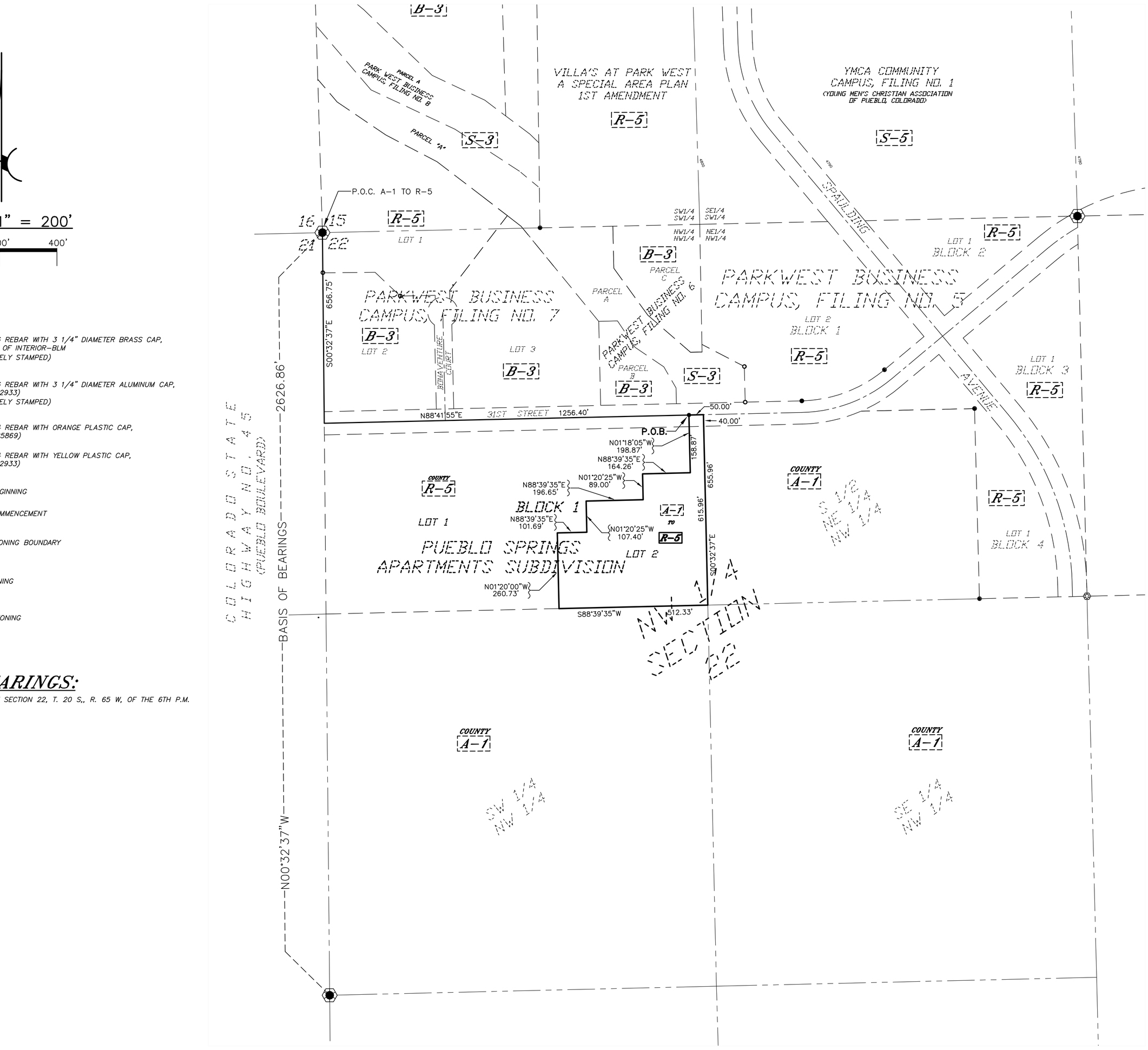
0 100' 200' 400'

LEGEND

⬢	FOUND NO. 6 REBAR WITH 3 1/4" DIAMETER BRASS CAP, DEPARTMENT OF INTERIOR–BLM (APPROPRIATELY STAMPED)
⬡	FOUND NO. 6 REBAR WITH 3 1/4" DIAMETER ALUMINUM CAP, (P.L.S. NO. 12933) (APPROPRIATELY STAMPED)
○	FOUND NO. 4 REBAR WITH ORANGE PLASTIC CAP, (P.L.S. NO. 25869)
◉	FOUND NO. 4 REBAR WITH YELLOW PLASTIC CAP, (P.L.S. NO. 12933)
P.O.B.	POINT OF BEGINNING
P.O.C.	POINT OF COMMENCEMENT
———	PROPOSED ZONING BOUNDARY
A-1	EXISTING ZONING
R-5	PROPOSED ZONING

BASIS OF BEARINGS:

THE WEST LINE OF NW 1/4 OF SECTION 22, T. 20 S,, R. 65 W, OF THE 6TH P.M. TO BEAR N. 00°32'37" W.



LAND DESCRIPTION

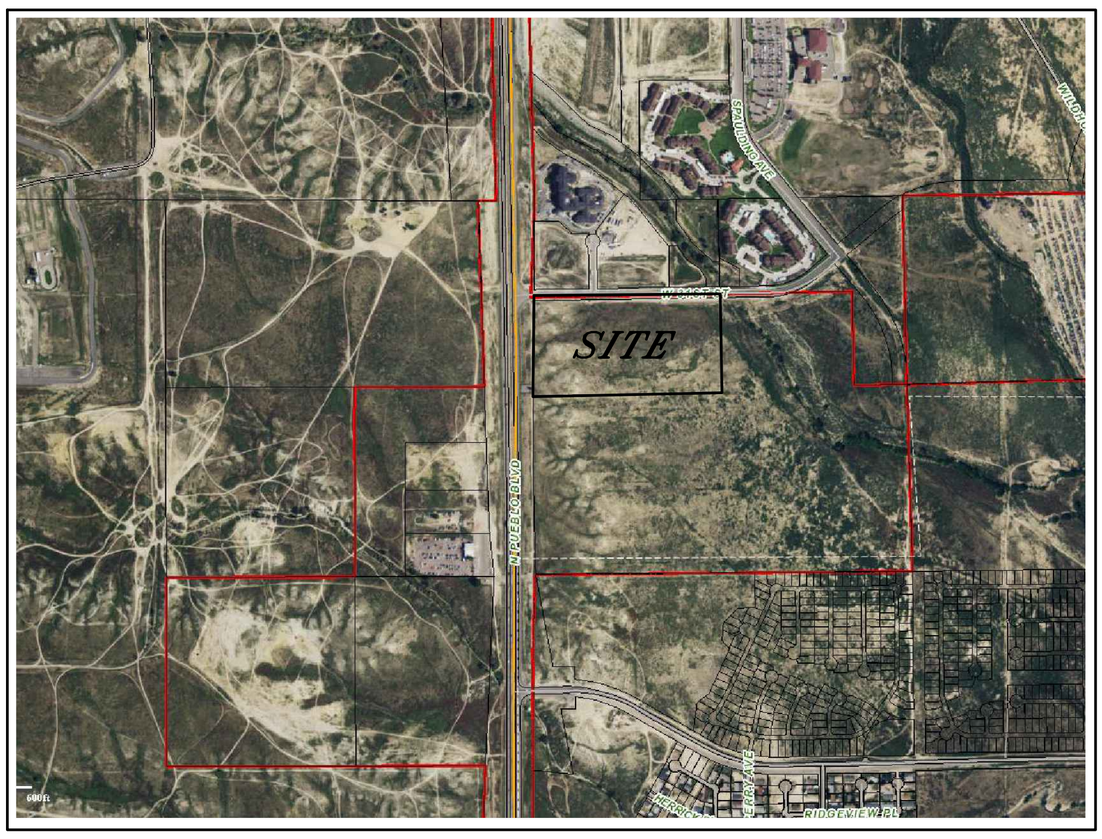
REZONE A–1 TO R–5

A portion of the South one–half of the Northwest one–quarter of the Northwest one–quarter of Section 22, Township 20 South, Range 65 West of the 6th P.M. and a portion of the South one–half of 31st Street as platted in Park West Business Campus, Filing No. 5, according to the recorded plat thereof, as filed for record on May 8, 2008 at Reception No. 1768305 in the County of Pueblo, State of Colorado, being more particularly described as follows:

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Commencing at Northwest corner of said Section 22, said point being on the west line of Park West Business Campus, Filing No. 7, according to the recorded plat thereof, as filed for record on March 16, 2012 at Reception No. 1901886 in the Pueblo County records and being on the east line of Colorado State Highway No. 45 as presently located; thence S. 00°32'37" E. along said the west line of said Section 22, the west line of said Park West Business Campus, Filing No. 7 and the east line of said Colorado State Highway No. 45, a distance of 656.75 feet to the center of 31st Street; thence N. 88°41'55" E., a distance of 1256.40 feet to the Point of Beginning; thence N. 88°41'55" E., a distance of 50.00 feet; thence S. 00°32'37" E., a distance of 40.00 feet to the northeasterly corner of Lot 2, Block 1 of the Pueblo Springs Apartments Subdivision as filed for record on June 22, 2023 at Reception No. 2316294 in the Pueblo County records; thence S. 00°32'37" E., a distance of 615.96 feet; thence S. 88°39'35" W., a distance of 512.33 feet; thence N. 01°20'00" W., a distance of 260.73 feet; thence N. 88°39'35" E., a distance of 101.69 feet; thence N. 01°20'25" W., a distance of 107.40 feet; thence N. 88°39'35" E., a distance of 196.65 feet; thence N. 01°20'25" W., a distance of 89.00 feet; thence N. 88°39'35" E., a distance of 164.26 feet; thence N. 01°18'05" W., a distance of 198.87 feet to the center of 31st St. and Point of Beginning.

Containing 4.75 acres, more or less.



VICINITY MAP

NOT TO SCALE

PREPARED BY: NORTHSTAR ENGINEERING AND SURVEYING, INC.

city of PUEBLO colorado
Planning & Community Development
211 East D Street | Pueblo, Colorado 81003 | Tel 719-553-2259 | Fax 719-553-2359 | TTY 719-553-2611 | www.pueblo.us

Planning & Zoning Map Amendment Application (Rezoning)

Please type or print clearly. Illegible applications will not be accepted. Case #: _____

Property Owner	
Name: Emery S. Chukly	
Company: Pueblo Springs Apartments II LLC, a Colorado Limited Liability Company	
Address: 5671 North Oracle Rd, Ste 1102, Tucson, AZ	Zip: 85704
Phone: ( )520-742-2114	Email: echukly@gmail.com
Applicant	
Name: Same as Owner	
Company:	
Address:	Zip:
Phone: ( )	Email:
Person or Firm Representing (If Different From) Owner or Applicant	
Name: Michael Cuppy	
Company: NorthStar Engineering & Surveying Inc.	
Address: 111 E. 5th St., Pueblo, CO	Zip: 81003
Phone: ( )719-544-6823	Email: mcuppy@northstar-co.com
*The **applicant** will be the primary contact unless otherwise noted.*	
Project Location: 31st St, S1/2, NW1/4, N1/4, Sec 22, T20S R65W (address or general description)	
Parcel# 0522005002	
Legal Description: See Attachment	
Subdivision: Pueblo Springs Apartments Sub.	Acreage: 4.70 acres more or less
Existing Zone District: A-1	**Proposed Zone District:** R-5

7-29-20

Purpose of this Application:

- ☑ To permit development of the property not allowed under the existing zone district.
- ☑ To provide proper zone district in conjunction with the subdivision plan for the area.
- ☐ In conjunction with the Annexation petition to annex the property in a use different than the existing Pueblo County Zoning.
- ☐ Other (specify):_____

(Continued from previous page)

Statement of Facts:

Justifying the zone change request. Be specific; use additional sheets if necessary.

The current Lot 2, Block 1 of the Pueblo Springs Apartment Sub. is zoned as a A-1. This rezone to R-5 would allow the remaining property to be developed as apartments which is the current use in Lot 1.

Description of area surrounding proposed development:

The site liews south of the existing 31st St. with the Villas at Parkwest development to the north side of 31st St., Pueblo Blvd. lies to the west and undeveloped rangeland lies to the south and east.

A general description of the proposed development to the distance which will be affected; such description including subjects of environmental effect, economic effect and traffic effect, if any; and such description carried out in scope and detail to the extent needed to support the requested amendment and as may be required by the Planning and Zoning Commission.

Existing 31st St. has the capacity and utlities to support the remaining development of the Pueblo Springs Apartment. There is existing drainage/detention facilities on site, as well as new drainage systems that will be installed as the time of development.

☑ A tentative site plan showing proposed structures, uses, open spaces, facilities for parking and loading and arrangements for pedestrian and vehicular circulation.

Estimated date for beginning project: December 1 2026

Estimated date for completion of project: November 1 2028

A statement reasonably indicating the applicant's economic responsibility and capability of accomplishing the development for which a zoning amendment is requested.

The applicant acknowledges the economic responsibility and has the capability of accomplishing the development for which the zoning amendment is requested.

☑ CD with DWF and DWG (Autocad) file of all plans and drawings & a PDF of all documents submitted. (**if applicable**)

By signing below, the Property Owner and Applicant are representing that each understands and agrees to the following terms:

1. Authorized personnel from the City of Pueblo, are hereby granted the right to enter the subject property for the purposes of reviewing and processing the application, including Certificate of Occupancy Inspections.

Office Use Only

Zoning Compliance (Completed by City Staff)	
Application received by:	Date:
Application checked for completeness by:	Date:
Case Manager:	Fee Paid:
Hearing date: ☐ Approved ☐ Denied ☐ Approved w/conditions	

211 East D Street | Pueblo, Colorado 81003 | Tel 719-553-2259 | Fax 719-553-2359 | TTY 719-553-2611 | www.pueblo.us

2. There are no known hazards or vicious animals present on the subject property.
3. All information contained in this application, is true and accurate to the best of my knowledge.
4. The City of Pueblo is under no obligation to approve the request contained in this application. No promises of approval are conveyed with the acceptance of this application.

Property Owner		
Print Name:	EMERY S CHUKLY / MANAGING MEMBER	
Signature:		Date: MARCH 5 2026
Applicant, if different from Property Owner		
Print Name:		
Signature:		Date:

Project Narrative
Pueblo Springs Apartments

The property is currently in the zoned A-1. This zoning map amendment will be the next steps for developing to current Lot 2, Block 1 of the Pueblo Springs Apartments Subdivision. The site lies south of existing 31st Street with the Villas at Parkwest Apartments development adjacent to the north side of 31st Street. The current zone district does not allow the development of multi-family apartments which is the proposed land use for said lot and reason for the zoning map amendment.

LEGEND:

GM GAS METER
WM WATER METER
EM ELECTRIC METER
GV GAS VALVE
ICV IRRIGATION CONTROL VALVE
WV WATER VALVE
FIRE HYDRANT
MH MANHOLE (UNKNOWN)
S SANITARY SEWER MANHOLE
ST STORM SEWER MANHOLE
T TELEPHONE MANHOLE
W WATER MANHOLE
CLEANOUT
LIGHT POLE
POWER POLE

S SANITARY SEWER LINE
ST STORM SEWER LINE
W WATER LINE
E ELECTRIC LINES
G GAS LINE
T TELECOMMUNICATIONS LINES
F FIBER OPTIC LINES
FENCING

4" CONCRETE SIDEWALK
PROPOSED BUILDING
4" HMA OVER 8" ABC

8" REINFORCED CONCRETE WITH NO. 4 REBAR @ 18" O.C. BOTH WAYS. 15' MAX JOINT SPACING. APPLY CONTINUOUS FLEXIBLE COMPOUND BETWEEN ASPHALT AND CONCRETE
6" CONCRETE DRIVE ACCESS. 15' MAX JOINT SPACING. MATCH JOINTS TO BUILDING FOUNDATION
LANDSCAPE AREA

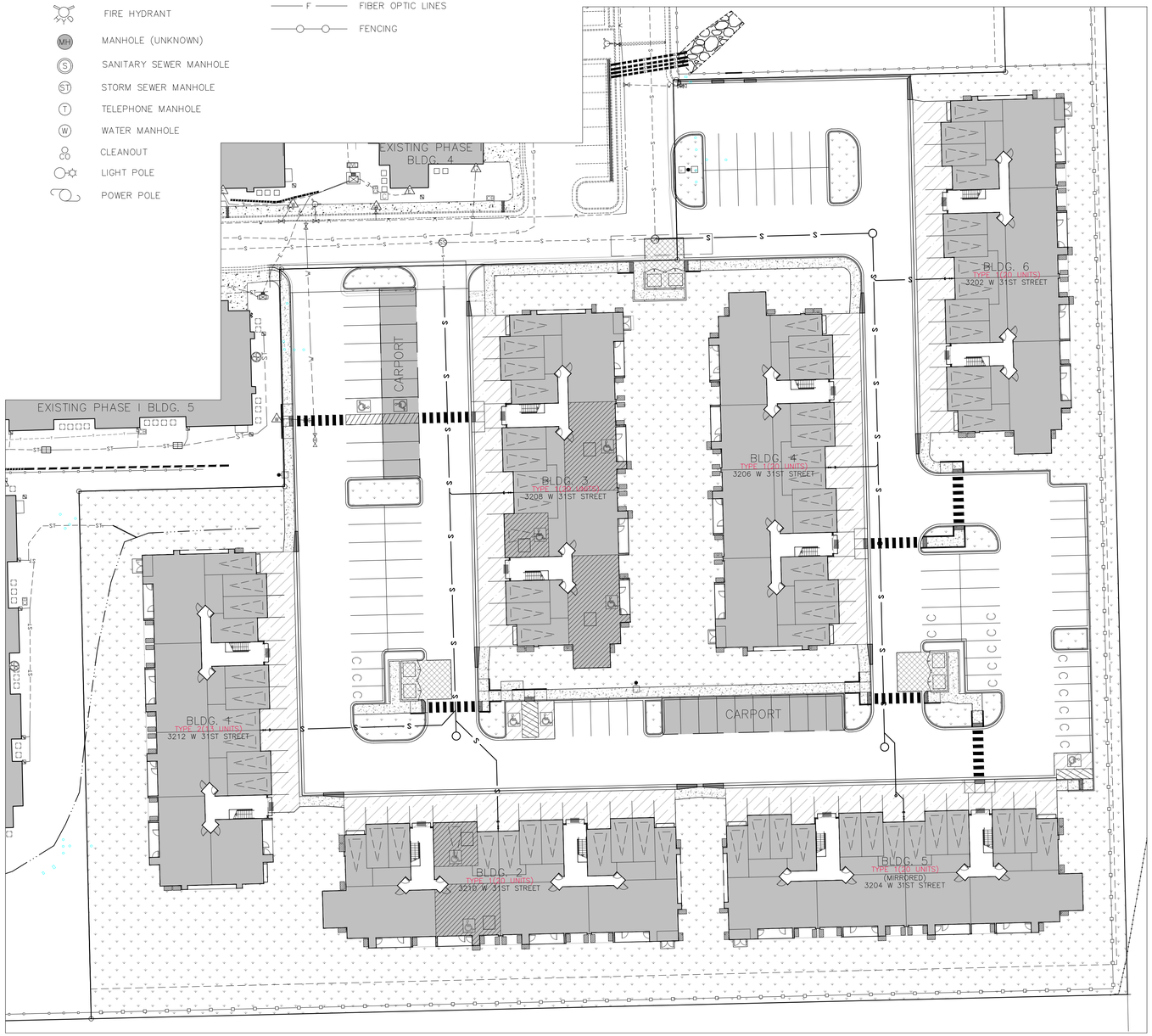


Exhibit “A”

REZONE A-1 TO R-5

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Containing 4.75 acres, more or less.

From: adam.lancaster@state.co.us on behalf of R2_Permits_Access - CDOT , CDOT
To: Riane Ledford
Subject: [External] Re: Z-26-03 Review 3210 W. 31st St.
Date: Thursday, March 19, 2026 9:04:22 PM
Attachments: image001.png

External email. Please use caution.

Riane

The submittals for Pueblo Springs Apartments 3210 W. 31st Street received March 18, 2026 have been reviewed by CDOT Access Management.

Our comments follow:

- Under Section 2.6 Change in Land Use and Access Use of the State Highway Access Code, states the requirements of a new access permit. It states in part that if any significant changes are made or will be made in the use of the property which will affect access operation, traffic volume increases by more than 20% and or vehicle type, the property owner will coordinate with the local authority and the Department to determine if a new access permit and modifications to the access are required.
- A CDOT Access Permit is needed for the intersection of 31st Street & Pueblo Blvd (SH045A). The City of Pueblo has discussed providing a traffic analysis for purposes of permitting all existing and potential uses for highway access at 31st Street.
- No direct access to State Highway 045A will be allowed other than 31st Street.

Thank you

On Wed, Mar 18, 2026 at 4:54 PM Riane Ledford <RLedford@pueblo.us> wrote:

> Hello Reviewers,
>
> Please review the rezoning for 3210 W. 31st St. (Z-26-03) by **April 1st, 2026**.
>
> Open Gov Case: PZ-26-10 Record - OpenGov
>
> Kindly,
>
> **Riane Ledford**
>
> Planner
>
> Planning and Community Development
>
> Main Line: (719)-553-2259

Direct Line: (719)-553-2321



This e-mail transmission (including any attachments) contains information that is confidential and may be legally privileged. It is intended for the use of the addressee only. If you received this e-mail in error, we request that you contact us immediately by telephone or return e-mail, and that you delete this message from your computer. If you are not the intended recipient, please be advised that any dissemination, distribution, or copying of this e-mail is strictly prohibited. [CoP]

--

Access Permits
R2 Traffic & Safety

April 24, 2026

The City Planning and Zoning Commission will hold a public hearing on a request from Nick Krasovic for the approval of the following application:

Z-26-03 Rezone: Rezoning of 4.7 acres located at 3210 W. 31st St. from Agricultural (A-1) Zone District to Multiple Residential and Office (R-5) Zone District.

The Planning and Zoning Commission meeting will be held on **May 13, 2026, at 3:30 p.m.** in City Council Chambers at 1 City Hall Place. The meeting will be recorded and can be viewed via Zoom, but **no testimony will be heard virtually** (Zoom info available at www.pueblo.us/PandZ).

You are welcome to attend this public hearing and express your viewpoint concerning this proposal. Written testimony can also be accepted up to 24 hours before the hearing date. To review the staff report for the proposed application, please visit www.pueblo.us/PandZ and click on "Most Recent Agenda" no sooner than the Friday prior to the hearing. **Please contact the planner listed below if you have questions**.

Beritt Odom, Planning & Community Development Director
By Riane Ledford, Planner
(719) 553-2259

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Beritt Odom, Planning & Community Development Director
By Riane Ledford, Planner
(719) 553-2259

CASE NUMBER: Z-26-03

CERTIFICATION

I hereby certify that I did this day cause written notice of the public hearing on the proposed Zoning Map Amendment of the property located at 3210 W.31st St.. to be sent to the attached list of owners of the real property lying within three hundred (300) feet of the said property on which the Zoning Map Amendment is proposed by depositing the same properly addressed and postage paid in the post office, as set forth in the Code of Ordinances, Section 17-6-2.

March 24, 2026
(Date)

PUEBLO PLANNING & ZONING COMMISSION

By: Cindy Capuchin

I hereby certify that I did this day verify and photograph the posted notice of the public hearing on the Zoning Map Amendment of the property located at 3201 W. 31st St. upon which action is pending as set forth in the Code of Ordinances, Section 17-6-2.

March 2, 2026
(Date)

PUEBLO PLANNING & ZONING COMMISSION

By: Cindy Capuchin

Owner	OwnerStree	OwnerCity	Owr	OwnerZip
C H H LLC	102 N CASCADE AVE STE 250	COLORADC	CO	80903-1409
KAISER FOUNDATION HEALTHPLAN OF COLORADO	10350 E DAKOTA AVE	DENVER	CO	80247-1314
PUEBLO MASTERPLAN COMMUNITIES LLC	1 JUDYS DREAM LN	PUEBLO	CO	81005-8703
PUEBLO SPRINGS APARTMENTS, LLC	5671 N ORACLE RD STE 1102	TUCSON	AZ	85704-3855
QWANZO LLC	102 N CASCADE AVE STE 250	COLORADC	CO	80903-1409
VILLAS AT PARK WEST I LP	1603 LBJ FWY STE 800	DALLAS	TX	75234-6061

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Beritt Odom, Director Planning and Community Development

SUBJECT: AN ORDINANCE AMENDING ZONING RESTRICTIONS TO REZONE OF 634 GOODNIGHT AVE FROM SUB-REGIONAL BUSINESS (B-2) ZONE DISTRICT TO SINGLE-FAMILY RESIDENTIAL (R-2) ZONE DISTRICT

SUMMARY:

The applicant is requesting to rezone of 634 Goodnight Ave from Sub-Regional Business (B-2) Zone District to Single-Family Residential (R-2) Zone District.

PREVIOUS COUNCIL ACTION:

None.

BACKGROUND:

The subject property, 634 Goodnight Ave., is a 4,968 sq ft former Mennonite Church on a 16,500 sq ft lot, east of City Park, in the Aberdeen Neighborhood. The church was built in 1959 and operated as such until 2023 when the property was purchased by 1Legacy Investments. The subject property was zoned into Sub-Regional Business (B-2) District in early 2025, as that buyer had intended to convert the former church building into an office/studio space. Now, since that change in use never occurred, the property owner is requesting to rezone into a Single-Family Residential (R-2) District in order to convert the commercial building into a single-family home. The surrounding neighborhood is residential, and the intended future land use of the subject property and adjacent block is residential.

FINANCIAL IMPLICATIONS:

There are no financial implications for the City.

BOARD/COMMISSION RECOMMENDATION:

The Planning and Zoning Commission, at their May 13, 2026, Regular Meeting, voted

7-0 to recommend approval.

STAKEHOLDER PROCESS:

The Planning Department sent out Notice of the Planning and Zoning Commission Public Hearing to all property owners located within 300 feet of the subject property.

A Public Notice poster was placed on the subject property 15 days prior to the Public Hearing.

ALTERNATIVES:

If City Council does not approve this Ordinance the property will not be rezoned in accordance with the Pueblo Municipal Code.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. Z-26-04 Attachments

ORDINANCE NO.

AN ORDINANCE AMENDING ZONING RESTRICTIONS TO REZONE OF 634 GOODNIGHT AVE FROM SUB-REGIONAL BUSINESS (B-2) ZONE DISTRICT TO SINGLE-FAMILY RESIDENTIAL (R-2) ZONE DISTRICT

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The zoning restrictions covering the following described property, and in addition half of all adjacent dedicated roadway and alley rights-of-way, together generally identified in the attached Rezone Exhibit, is hereby changed from Sub-Regional Business (B-2) Zone District to Single-Family Residential (R-2) Zone District:

LOTS 1 TO 5 BLK 1 ADAMS SUB

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of the Ordinance to implement the policies and procedures described herein.

SECTION 3.

This Ordinance shall become effective immediately upon final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

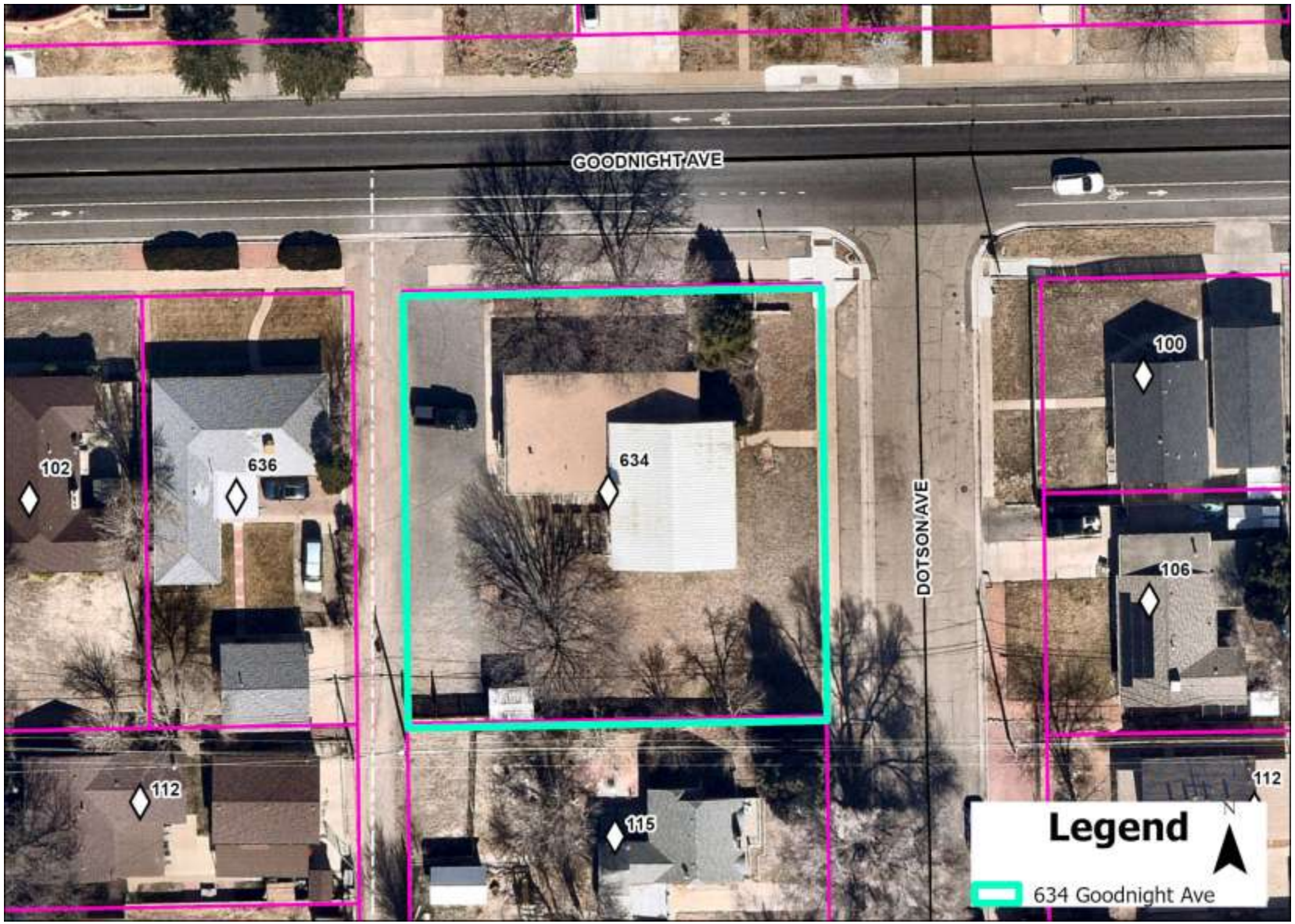
☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Rezoning Exhibit for 634 Goodnight Ave
B-2 Zone District to R-2 Zone District



Legal Description: LOTS 1 TO 5 BLK 1 ADAMS SUB

Mike Castellucci
Chair

Patrick Avalos
Vice Chair

Brett Boston
City Council Representative

city of PUEBLO colorado
Planning & Zoning Commission

Alexandra Aznar

Elizabeth Bailey

Cheryl Spinuzzi

James Salazar

MINUTES OF REGULAR MEETING

City of Pueblo, Colorado
Wednesday, May 13, 2026, 3:30 p.m.
City Council Chambers, 1 City Hall Place

The meeting was called to order at 3:31 pm. with Castellucci presiding.

Commissioners Present: Brett Boston, Mike Castellucci, Patrick Avalos, Alexandra Aznar, Elizabeth Bailey, Cheryl Spinuzzi, and James Salazar.

Commissioners Absent: N/A

Staff Members Present*:* Laura Portis, Assistant City Attorney; Beritt Odom, Director of Planning and Community Development; Mikaylin Hackley, Planner; Riane Ledford, Planner; and Cindy Capritta, Land Use Technician.

Staff Members Absent: N/A

Approval of the Agenda: Bailey moved to approve the agenda, seconded by Boston.

Motion Passed: 7-0.

Z-26-04 Rezone: A rezoning of 0.38 acres located at 634 Goodnight Ave from Sub-Regional Business (B-2) Zone District to Single-Family Residential (R-2) Zone District. Staff Report by Mikaylin Hackley, Planner.

Hearing: Applicant Gerard Trujillo was sworn in and spoke in support of the application. No one spoke in opposition.

Commission Action: Bailey moved to forward a recommendation of approval to City Council, seconded by Salazar

Motion Passed: 7-0

Mike Castellucci
Chair

Patrick Avalos
Vice Chair

Brett Boston
City Council Representative

Alexandra Aznar

Elizabeth Bailey

Cheryl Spinuzzi

James Salazar

city of PUEBLO colorado

Planning & Zoning Commission

Z-26-04

May 11, 2026

TO:	City of Pueblo Planning and Zoning Commission
FROM:	Mikaylin Hackley, Planner
THROUGH:	Beritt Odom, Director of Planning and Community Development
SUBJECT:	Rezoning of 634 Goodnight from B-2 to R-2 Zone Districts
APPLICANT:	Gerard Lee Trujillo
PROPERTY OWNER:	Gerard Lee Trujillo
LOCATION:	634 Goodnight Ave., Pueblo, CO 81005
CONCURRENT REQUESTS:	N/A

REQUEST:
A rezoning of 634 Goodnight Ave from Sub-Regional Business (B-2) Zone District to Single-Family Residential (R-2) Zone District

BACKGROUND AND ANALYSIS:

The subject property, 634 Goodnight Ave., is a 4,968 sq ft former Mennonite Church on a 16,500 sq ft lot, east of City Park, in the Aberdeen Neighborhood. The church was built in 1959 and operated as such until 2023 when the property was purchased by 1Legacy Investments. The subject property was zoned into Sub-Regional Business (B-2) District in early 2025, as that buyer had intended to convert the former church building into an office/studio space. Now, since that change in use never occurred, the property owner is requesting to rezone into a Single-Family Residential (R-2) District in order to convert the commercial building into a single-family home.

The surrounding neighborhood is residential, and the intended future land use of the subject property and adjacent block is to remain as a medium-density residential neighborhood. While inspecting the site, staff noted that a short pole sign (pictured in attachments) that once advertised the church was still present on the property, and a temporary banner sign advertising a painting business was hung on the signposts. Off-site advertising and permanent signage are not permitted in an R-2 Zone District, so staff recommends conditioning the rezoning on the removal of the commercial sign to increase the site's compatibility with the surrounding residential neighborhood.

SITE CHARACTER AND COMPATIBILITY

Site Character:

Neighborhood Compatibility:	North:	Single-Family Residential (R-1) Zone District, Developed with single-family homes

East: Single-Family Residential (R-2) Zone District, Developed with single-family homes
South: Single-Family Residential (R-2) Zone District, Developed with single-family homes
West: Single-Family Residential (R-2) Zone District, Developed with single-family homes

Comprehensive Plan Compliance: The subject site is designated by the Pueblo Regional Comprehensive Plan, 2022, as Urban Neighborhood. The Urban Neighborhood classification calls for primary land uses of single-family homes, duplexes, and townhomes and supporting land uses of ADUs, multi-family dwellings, retail and services, and neighborhood uses.

ZONING AMENDMENT TEST

The standard for accepting an amendment to the zoning map is that the proposed zoning action must either:

1) Further the goals and objectives of the comprehensive land use plan, or

❑ Comments **The rezoning request furthers the goals of the Comprehensive Plan by reusing a vacant church building and converting it into a home, which is consistent with the Urban Neighborhoods land use designation of the property.**

2) Show that the area has changed significantly since the adoption of the comprehensive land use plan

❑ Comments **Not Applicable**

3) Show that there was a mistake or error made in the original zoning of the property.

❑ Comments **Not Applicable**

APPLICATION REQUIREMENT PER §17-6-1 OF THE PUEBLO MUNICIPAL CODE

The applicant's name and address and the name and address of any person, firm or corporation represented by such applicant in the application

❑ Comments **The application contains the required information.**

The interest of the applicant and the interest of the person, firm or corporation represented by the applicant, be it legal, sales development, operation, or other interest.

❑ Comments **The application contains the required information.**

The nature of the amendment and a legal description of the property that would be affected by the amendment.

❑ Comments **The application contains the required information.**

A statement of the facts which the applicant believes justify the amendment; provided; however, that when any amendment changing the zoning map is requested, the following additional information shall be furnished:

❑ Comments **The application contains the required information.**

A general description of the proposed development to the distance which will be affected; such description including subjects of environmental effect, economic effect, and traffic effect, if any; and such description carried out in scope and detail to the extent needed to support the requested amendment and as may be required by the Planning and Zoning Commission.

❑ Comments **The application contains the required information.**

A tentative site plan showing proposed structures, uses, open spaces, facilities for parking and loading and arrangements for pedestrian and vehicular circulation.

❑ Comments **The application contains the required information.**

A statement of the proposed time schedule for beginning and completion of development.

❑ Comments **The application contains the required information.**

A statement reasonably indicating the applicant's economic responsibility and capability of accomplishing the development for which a zoning amendment is requested.

❑ Comments **The application contains the required information.**

CONTEXT OF ZONE DISTRICT REQUIREMENTS PER §17-4-51(a)(4) OF THE PMC:

Single-Family Residential (R-2) Zone District Standards:
Purpose. The standards of this district (R-2) are designed to retain and provide areas primarily for single-family development of medium density.

RECOMMENDED ACTION:
If the Planning and Zoning Commission makes the necessary findings of fact, a recommendation to City Council for approval of the rezone request is appropriate subject to the following condition:

1. The freestanding sign on the subject property must be removed prior to Planning approval of a building permit for the change-of-occupancy into a residence.

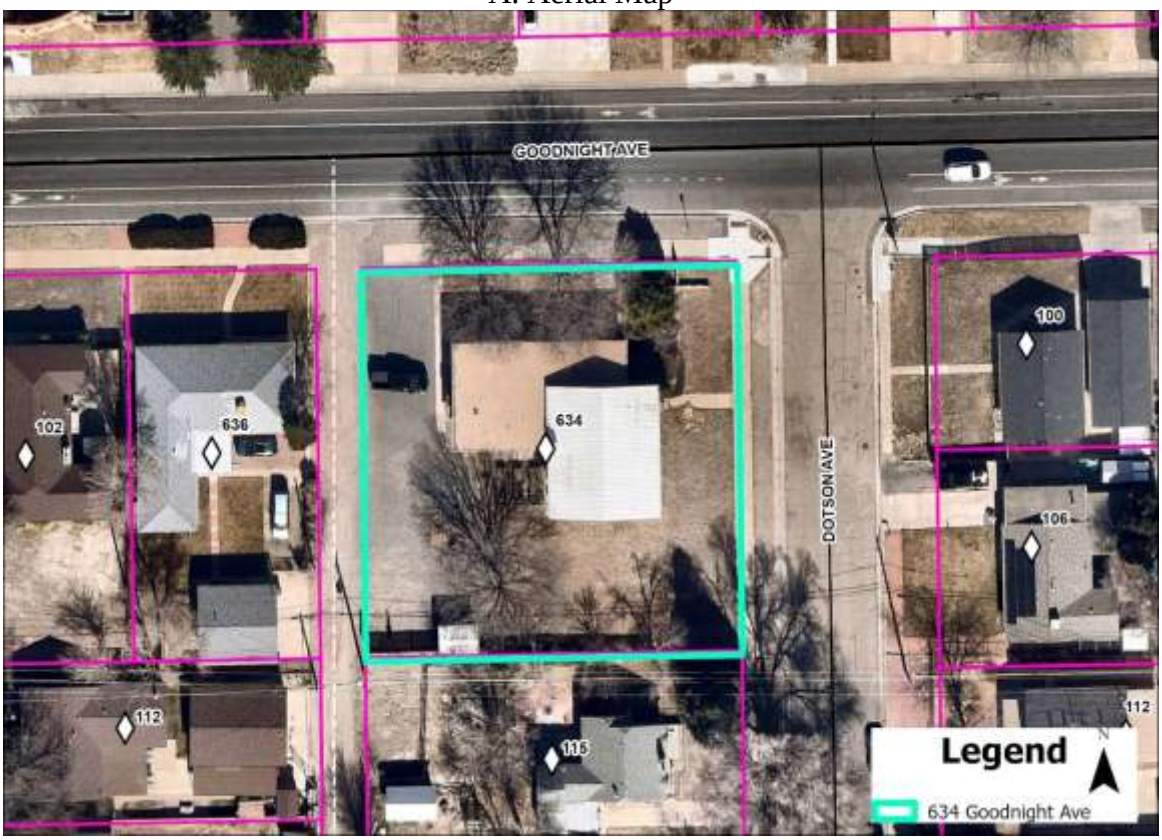
REFERRAL AGENCIES AND COMMENTS:

• City Public Works	No comment
• City Transportation	No comment
• City Law Department	No comment
• Southern Colorado Building Department	Southern Colorado Building Department has no comments currently. The change of the commercial building to residential constitutes a change in occupancy for that building and the project will be required to go through the residential plan review process.
• City Fire Department	No comment
• City Wastewater	No comment
• City Stormwater	No comment
• City Parks and Recreation Department	No comment
• Xcel Energy	No comment
• Black Hills Energy	No comment
• CDOT	No comment

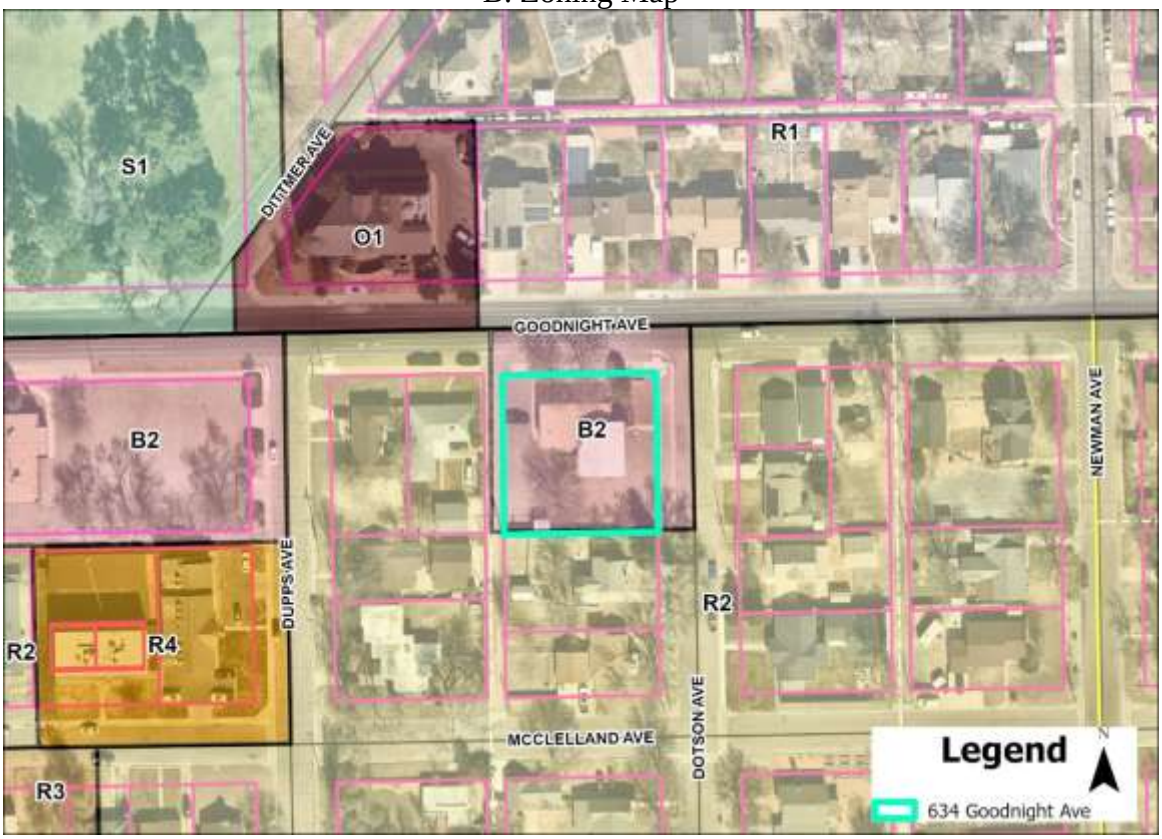
ATTACHMENTS:

A. Aerial Map
B. Zoning Map
C. Comprehensive Plan Map
D. Public Notice Photo
E. Rezoning Exhibit

A. Aerial Map



B. Zoning Map



C. Comprehensive Plan Map



D. Public Notice & Site Photos



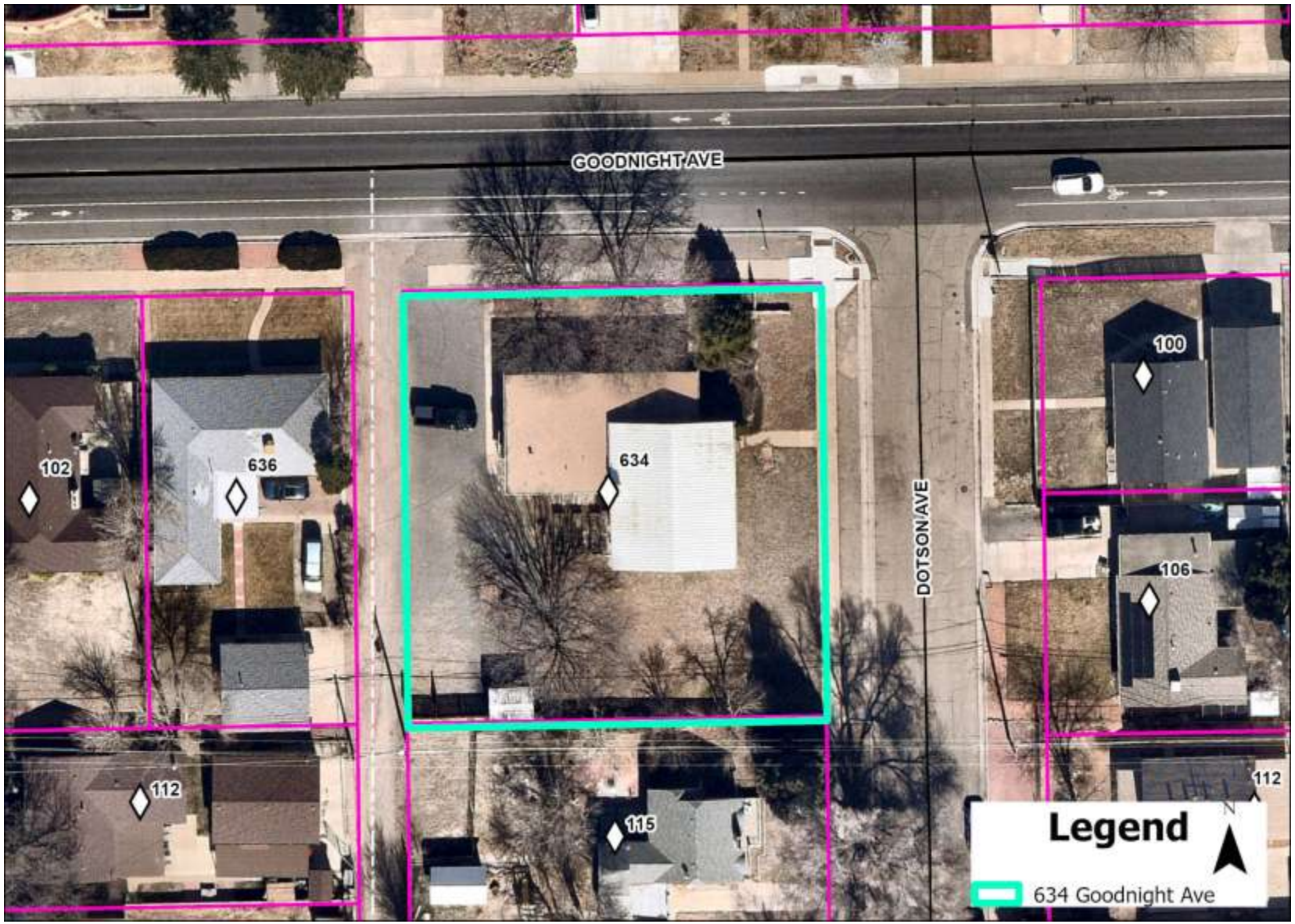







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Rezoning Exhibit for 634 Goodnight Ave
B-2 Zone District to R-2 Zone District



Legal Description: LOTS 1 TO 5 BLK 1 ADAMS SUB

Statement of Facts – Justifying the Zone Change

The applicant is requesting a rezoning of the property located at 634 Goodnight Ave, Pueblo, Colorado, back to its original designation of R-2 (Residential), which was recently changed by the prior owner to B-2 (Commercial). The new property owner wishes to occupy the property as his personal residence for his family. The property contains an existing structure that was previously used as a church and is well suited for conversion into a single-family home.

The proposed rezoning is consistent with the City of Pueblo Comprehensive Plan, which encourages reinvestment and residential development within established areas of the city. Repurposing the existing structure will allow the property to be used in a productive manner while maintaining the character of the neighborhood.

The surrounding area consists primarily of residential properties, with some small institutional and commercial uses. The requested R-2 zoning will be compatible with nearby land uses and development patterns.

The proposed project will involve the conversion of the existing building into single-family residential living, with appropriate parking and access maintained on the site. The exterior of the building will largely remain unchanged, minimizing impacts to the surrounding area. No significant environmental, traffic, or infrastructure impacts are anticipated.

Approval of the requested zoning amendment will provide a public benefit by increasing housing availability, encouraging the adaptive reuse of an existing structure, and supporting neighborhood stability and revitalization. The proposed project represents an adaptive reuse of a structure that is currently underutilized, which will preserve the building while providing needed housing and preventing potential vacancy or further deterioration of the property.

Description of Area Surrounding Proposed Development

The surrounding area consists primarily of residential properties, with some small commercial and institutional uses. The requested R-2 zoning will be consistent with nearby residential zoning and will allow the property to integrate with the surrounding neighborhood character.

General Description of the Proposed Development

The existing building on the property will be converted into single-family residential living. The structure will remain largely unchanged externally, aside from improvements intended to bring the property in line with the surrounding beauty and character of the Aberdeen neighborhood, which will include a total exterior makeover, as shown in the picture provided.

Adequate parking will be provided on-site, and existing access points will continue to serve the property. No significant environmental, traffic, or economic impacts are anticipated from the proposed development.

Planning & Zoning Map Amendment Application

Please type or print clearly. Illegible applications will not be accepted. Case #: _____

Property Owner	
Name: Gerard Lee Trujillo	
Company:	
Address: 714 w 9th St	Zip: 81003
Phone: (719) 250-7608	Email: Pueblooautoexperts@gmail.com
Applicant	
Name: Gerard Lee Trujillo	
Company:	
Address: 714 w 9th St	Zip: 81003
Phone: (719) 250 7608	Email: Pueblooautoexperts@gmail.com
Person of Firm Representing Owner or Applicant	
Name:	
Company:	
Address:	Zip:
Phone: ( )	Email:
The applicant will be the primary contact unless otherwise noted.	

Project Location: (address or general description) 634 Goodnight Ave Pueblo CO 81005

Legal Description: Lots 1 TO 5 BLK 1 Adams Sub

Subdivision: Adams Sub Acreage: 0.38

Existing Zone District: B-2 **Proposed Zone District:** R-2

Purpose of this Application:

- [x] To permit development of the property not allowed under the existing zone district.
- [ ] To provide proper zone district in conjunction with the subdivision plan for the area.
- [ ] In conjunction with the Annexation petition to annex the property in a use different than the existing Pueblo County Zoning.
- [ ] Other (specify): _____

(Continue Next Page)

(Continued from previous page)

Statement of Facts:
Justifying the zone change request. Be specific; use additional sheets if necessary.

See Attached

Description of area surrounding proposed development:

See Attached

A general description of the proposed development to the distance which will be affected; such description including subjects of environmental effect, economic effect and traffic effect, if any; and such description carried out in scope and detail to the extent needed to support the requested amendment and as may be required by the Planning and Zoning Commission.

See Attached

☒ A tentative site plan showing proposed structures, uses, open spaces, facilities for parking and loading and arrangements for pedestrian and vehicular circulation.

Estimated date for beginning project: 5- 2026

Estimated date for completion of project: 8- 2026

A statement reasonably indicating the applicant's economic responsibility and capability of accomplishing the development for which a zoning amendment is requested.

The applicant has the financial and resources necessary to Complete the proposed residential Conversion and improvements associated with the Project

☐ CD with DWF and DWG (Autocad) file of all plans and drawings & a PDF of all documents submitted. **(if applicable)**

By signing below, the Property Owner and Applicant are representing that each understands and agrees to the following terms:

1. Authorized personnel from the City of Pueblo, are hereby granted the right to enter the subject property for the purposes of reviewing and processing the application, including Certificate of Occupancy Inspections.
2. There are no known hazards or vicious animals present on the subject property.
3. All information contained in this application, is true and accurate to the best of my knowledge.
4. The City of Pueblo is under no obligation to approve the request contained in this application. No promises of approval are conveyed with the acceptance of this application.

Property Owner			
Print Name:	Gerard Lee Taylor		
Signature:		Date:	3-6-26
Applicant, if different from Property Owner			
Print Name:			
Signature:		Date:	

Office Use Only	**Zoning Compliance (Completed by City Staff)**	
	Application received by:	Date:
	Application checked for completeness by:	Date:
	Case Manager:	Fee Paid:
	Hearing date: ☐ Approved ☐ Denied ☐ Approved w/conditions	









April 24, 2026

The City Planning and Zoning Commission will hold a public hearing on a request from Gerard Trujillo for the approval of the following application:

Z-26-04 Rezone: Rezoning of 0.38 acres located at 634 Goodnight Ave from Sub-Regional Business (B-2) Zone District to Single-Family Residential (R-2) Zone District.

The Planning and Zoning Commission meeting will be held on **May 13, 2026, at 3:30 p.m.** in City Council Chambers at 1 City Hall Place. The meeting will be recorded and can be viewed via Zoom, but **no testimony will be heard virtually** (Zoom info available at www.pueblo.us/PandZ).

You are welcome to attend this public hearing and express your viewpoint concerning this proposal. Written testimony can also be accepted up to 24 hours before the hearing date. To review the staff report for the proposed application, please visit www.pueblo.us/PandZ and click on "Most Recent Agenda" no sooner than the Friday prior to the hearing. **Please contact the planner listed below if you have questions**.

Beritt Odom, Planning & Community Development Director
By Mikaylin Hackley, Planner
(719) 553-2259

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Beritt Odom, Planning & Community Development Director
By Mikaylin Hackley, Planner
(719) 553-2259

CASE NUMBER: Z-26-04

CERTIFICATION

I hereby certify that I did this day cause written notice of the public hearing on the proposed Zoning Map Amendment of the property located at 634 Goodnight Ave. to be sent to the attached list of owners of the real property lying within three hundred (300) feet of the said property on which the Zoning Map Amendment is proposed by depositing the same properly addressed and postage paid in the post office, as set forth in the Code of Ordinances, Section 17-6-2.

March 2, 2026
(Date)

PUEBLO PLANNING & ZONING COMMISSION

By: Cindy Capuchin

I hereby certify that I did this day verify and photograph the posted notice of the public hearing on the Zoning Map Amendment of the property located at 634 Goodnight Ave.. upon which action is pending as set forth in the Code of Ordinances, Section 17-6-2.

March 2, 2026
(Date)

PUEBLO PLANNING & ZONING COMMISSION

By: Cindy Capuchin

Owner	OwnerStree	OwnerCity	Owr	OwnerZip
720 GOODNIGHT LLC	606 W EVANS AVE	PUEBLO	CO	81004-1504
AHLIN LLC	447 ARGYLE AVE	PUEBLO	CO	81004-1012
AUSTIN DARIN A/AUSTIN JACQUEINE J	607 GOODNIGHT AVE	PUEBLO	CO	81005-1224
BARNES CAROLYN E	200 DUPPS AVE	PUEBLO	CO	81005-1221
BAROS RAYMOND LOUIS/BAROS BARBARA JEAN	627 GOODNIGHT AVE	PUEBLO	CO	81005-1224
BIGGERSTAFF D W	PO BOX 7355	PUEBLO W	CO	81007-7355
BOWEN ANGELA J	603 MCCLELLAND AVE	PUEBLO	CO	81005-1226
CATS CHICKENS & JUST FOR FUN TRUST	616 DITTMER AVE	PUEBLO	CO	81005-1212
CESARIO RACHEL LOUISE	204 DOTSON AVE	PUEBLO	CO	81005-1217
CORZINE MEGAN L	210 DOTSON AVE	PUEBLO	CO	81005-1217
DILL DAVID L/RAWLINGS JANE L	624 DITTMER AVE	PUEBLO	CO	81005-1212
DURAN EDWARD G/DURAN ROSE E	621 GOODNIGHT AVE	PUEBLO	CO	81005-1224
FLORES GERARD M	606 DITTMER AVE	PUEBLO	CO	81005-1212
GARLAND LANE PROPERTIES LLC	120 DOTSON AVE	PUEBLO	CO	81005-1215
GONZALES LAFON	310 STARLITE DR	PUEBLO	CO	81005-2683
GUERRERO RUSSELL I/GUERRERO SHANNON R	620 DITTMER AVE	PUEBLO	CO	81005-1212
HALLETT TIMOTHY JAMES / HALLETT BREANNA MONIQUE	602 GOODNIGHT AVE	PUEBLO	CO	81005-1225
HUNDT THERESA A	207 E GALATEA DR	PUEBLO W	CO	81007-2709
JOHNSON WILLIAM T	120 DOTSON AVE	PUEBLO	CO	81005-1215
KNEUPER JENNIFER M / KNEUPER CLETUS PAUL	630 DITTMER AVE	PUEBLO	CO	81005-1212
MARTIN CHARLES A/MARTIN BROOKE SUZANNE/	10957 MIDDLEGATE CT	PEYTON	CO	80831-5049
MC GILL RICHARD ROY	203 DUPPS AVE	PUEBLO	CO	81005-1220
MIGHELL KAREN	111 NEWMAN AVE	PUEBLO	CO	81005-1322
MIKETA GARY A/MIKETA MONICA L	601 GOODNIGHT AVE	PUEBLO	CO	81005-1224
MOBILE HOME COLORADO CITY LLC	2543 W HOUSTOUN WAI	LITTLETON	CO	80120
MYERS TRAVIS	106 DOTSON AVE	PUEBLO	CO	81005-1215
RESIDENCE	PO BOX 432	PUEBLO	CO	81002-0432
PARK MANOR CONDOMINIUMS	UNKNOWN	PUEBLO	CO	
ROSS ADAM J	633 GOODNIGHT AVE	PUEBLO	CO	81005-1224
SAGE PARNERS LLC	5425 NATURE CENTER RI	PUEBLO	CO	81003
SAMUELS WILLIAM G/SAMUELS MARILYN I	91 CORNELL CIR	PUEBLO	CO	81005-1645
SANCHEZ MICHAEL A	100 DOTSON AVE	PUEBLO	CO	81005-1215
SANTOS DAVID F	112 DUPPS AVE	PUEBLO	CO	81005-1219
SMART IRA/SMART ILA/STONE RHONDA K	4282 COUNTY 4 NE	REMER	MN	56672-2403
TRUJILLO FAMILY TRUST	613 GOODNIGHT AVE	PUEBLO	CO	81005-1224
VILLEGAS JESUS V	617 GOODNIGHT AVE	PUEBLO	CO	81005-1224

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Beritt Odom, Director Planning and Community Development

SUBJECT: AN ORDINANCE AMENDING ZONING RESTRICTIONS TO REZONE 0.37 ACRES LOCATED AT 229 W. 12TH ST. FROM MULTIPLE RESIDENTIAL AND OFFICE DISTRICT (R-5) ZONE DISTRICT TO NEIGHBORHOOD BUSINESS (B-1) ZONE DISTRICT

SUMMARY:

The applicant is requesting to rezone 0.37 acres located at 229 W. 12th St. from Multiple Residential and Office District (R-5) Zone District to Neighborhood Business (B-1) Zone District.

PREVIOUS COUNCIL ACTION:

None.

BACKGROUND:

The applicant is requesting to rezone 229 W 12th St., the site of the locally landmarked historic Bowen Mansion, from an R-5 Zone District to a B-1 District in order to convert the existing home into a retail thrift store for clothes and books on floors 1 and 2 and a co-working office space on floor 3. Should this rezoning request be approved, the applicant intends to repair and restore the structure, but no additions to the building footprint or new structures are proposed. The applicant presented staff with their planned scope of work of the restoration and repairs, which intended to preserve the historic integrity of the structure. Any future plans that might “materially alter, restore, construct on, relocate, remove, or in any way significantly change” the historic character of the site will require issuance of a Certificate of Appropriateness from the Historic Preservation Commission.

The property was most recently utilized as an office space for the Pueblo County Planning Department, and offices would remain a use-by-right in the requested B-1 district. Per Sec. 17-4-51 (d) (47), retail sales are permitted in the B-1 district subject to the following conditions:

a. Shall not exceed three thousand two hundred fifty (3,250) square feet in gross floor area.

b. Limited to neighborhood retail uses, as determined by the Administrative Official.

c. Outdoor display, storage, or drop-off facilities are prohibited.

The applicant's proposed business plan does not exceed more than 3,250 sq. ft. of retail space, and staff has determined that a thrift store selling only clothes and books (no furniture or other large secondhand-items items) meets the intent of a neighborhood retail use. Per the off-street parking code, the co-working space and the secondhand retail space would necessitate 21 parking spaces in total, 16 for the retail use and 5 for the office space. The rezoning site contains 18 parking spaces, 2 of which are ADA accessible. The two parcels to the east of the rezoning site will remain under Pueblo County ownership as overflow parking for their nearby civic buildings, but a shared parking agreement has been recorded to accommodate the additional parking spaces required by the rezoning and change in land use.

FINANCIAL IMPLICATIONS:

There are no financial implications for the City.

BOARD/COMMISSION RECOMMENDATION:

The Planning and Zoning Commission, at their May 13, 2026, Regular Meeting, voted 7-0 to recommend approval.

STAKEHOLDER PROCESS:

The Planning Department sent out Notice of the Planning and Zoning Commission Public Hearing to all property owners located within 300 feet of the subject property.

A Public Notice poster was placed on the subject property 15 days prior to the Public Hearing.

ALTERNATIVES:

If City Council does not approve this Ordinance the property will not be rezoned in accordance with the Pueblo Municipal Code.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. Z-26-05 Attachments

ORDINANCE NO.

AN ORDINANCE AMENDING ZONING RESTRICTIONS TO REZONE 0.37 ACRES LOCATED AT 229 W. 12TH ST. FROM MULTIPLE RESIDENTIAL AND OFFICE DISTRICT (R-5) ZONE DISTRICT TO NEIGHBORHOOD BUSINESS (B-1) ZONE DISTRICT

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The zoning restrictions covering the following described property, and in addition half of all adjacent dedicated roadway and alley rights-of-way, together generally identified in the attached Rezone Exhibit, is hereby changed from Multiple Residential and Office (R-5) Zone District to Neighborhood Business (B-1) Zone District:

LOTS 9, 10, AND 11, BLOCK 11, COUNTY ADDITION TO THE CITY OF PUEBLO, COUNTY OF PUEBLO, STATE OF COLORADO.

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of the Ordinance to implement the policies and procedures described herein.

SECTION 3.

This Ordinance shall become effective immediately upon final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

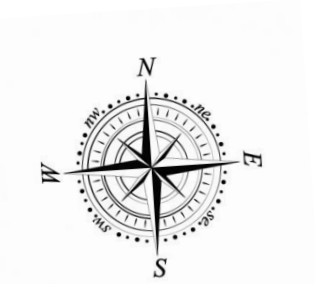
_____
President of City Council

ATTEST

_____
City Clerk

Zoning Map Amendment Exhibit
Parcels: 0525416005 and 0525416010
Lots 9, 10, and 11, Block 11, County Addition
Address: 229 W 12th St, Pueblo, CO 81003
Existing Zoning: R-5
Proposed Zoning: B-1





Mike Castellucci
Chair

Patrick Avalos
Vice Chair

Brett Boston
City Council Representative

city of PUEBLO colorado
Planning & Zoning Commission

Alexandra Aznar

Elizabeth Bailey

Cheryl Spinuzzi

James Salazar

MINUTES OF REGULAR MEETING
City of Pueblo, Colorado
Wednesday, May 13, 2026, 3:30 p.m.
City Council Chambers, 1 City Hall Place

The meeting was called to order at 3:31 pm. with Castellucci presiding.

Commissioners Present: Brett Boston, Mike Castellucci, Patrick Avalos, Alexandra Aznar, Elizabeth Bailey, Cheryl Spinuzzi, and James Salazar.

Commissioners Absent: N/A

Staff Members Present*:* Laura Portis, Assistant City Attorney; Beritt Odom, Director of Planning and Community Development; Mikaylin Hackley, Planner; Riane Ledford, Planner; and Cindy Capritta, Land Use Technician.

Staff Members Absent: N/A

Approval of the Agenda: Bailey moved to approve the agenda, seconded by Boston.

Motion Passed: 7-0.

Public Hearing:

Z-26-05 Rezone: A rezoning of 0.37 acres located at 229 W. 12th St. from Multiple Residential and Office District (R-5) Zone District to Neighborhood Business **(**B-1) Zone District. Staff Report by Mikaylin Hackley, Planner.

Hearing: Applicant Micah Lorenc was sworn in and spoke in support of the application. No one spoke in opposition.

Commission Action: Bailey motioned to forward a recommendation of approval to City Council, seconded by Boston.

Motion Passed: 7-0

Mike Castellucci
Chair

Patrick Avalos
Vice Chair

Brett Boston
City Council Representative

Alexandra Aznar

Elizabeth Bailey

Cheryl Spinuzzi

James Salazar

city of PUEBLO colorado

Planning & Zoning Commission

Z-26-05

May 11, 2026

TO:	City of Pueblo Planning and Zoning Commission
FROM:	Mikaylin Hackley, Planner
THROUGH:	Beritt Odom, Director of Planning and Community Development
SUBJECT:	Rezoning 229 W 12th St. from R-5 to B-1 Zone District
APPLICANT:	Micah Lorenc; Purple Mountain Holdings LLC
PROPERTY OWNER:	Pueblo County
LOCATION:	229 W 12th St., Pueblo, CO 81003
CONCURRENT REQUESTS:	N/A

REQUEST:
A rezoning of 0.37 acres located at 229 W. 12th St. from Multiple Residential and Office District (R-5) Zone District to Neighborhood Business (B-1) Zone District.

BACKGROUND AND ANALYSIS:
The applicant is requesting to rezone 229 W 12th St., the site of the locally landmarked historic Bowen Mansion, from an R-5 Zone District to a B-1 District in order to convert the existing home into a retail thrift store for clothes and books on floors 1 and 2 and a co-working office space on floor 3. Should this rezoning request be approved, the applicant intends to repair and restore the structure, but no additions to the building footprint or new structures are proposed. The applicant presented staff with their planned scope of work of the restoration and repairs, which intended to preserve the historic integrity of the structure. Any future plans that might "materially alter, restore, construct on, relocate, remove, or in any way significantly change" the historic character of the site would require issuance of a Certificate of Appropriateness from the Histoirc Preservation Commission.

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b. Limited to neighborhood retail uses, as determined by the Administrative Official.
c. Outdoor display, storage, or drop-off facilities are prohibited.

The applicant's proposed business plan does not exceed more than 3,250 sq. ft. of retail space, and staff has determined that a thrift store selling only clothes and books (no furniture or other large second-items items) meets the intent of a neighborhood retail use. Per off-street parking code, the co-working space and the second-hand retail space would necessitate 21 parking spaces in total, 16 for the retail use and 5 for the office

space. The rezoning site contains 18 parking spaces, 2 of which are ADA accessible. The two parcels to the east of the rezoning site will remain under Pueblo County ownership as overflow parking for their nearby civic buildings, but a shared parking agreement has been drafted to accommodate the additional parking spaces required by the rezoning and change in land use. Staff finds that with this condition addressed, the rezoning of this site into the low-intensity commercial Neighborhood Business (B-1) Zone District is appropriate.

SITE CHARACTER AND COMPATIBILITY

Site Character:

Neighborhood Compatibility:

North: Multiple-Residential and Office (R-5) District, Developed with a medical office building
East: Multiple-Residential and Office (R-5) District, Developed with apartments and a theater
South: Multiple-Residential and Office (R-5) District, Developed with a medical office building
West: Multiple-Residential and Office (R-5) District, Developed with Pueblo County civic buildings

Comprehensive Plan Compliance:

The subject site is designated by the Pueblo Regional Comprehensive Plan, 2022, as Downtown Mixed-Use. The Downtown Mixed-Use classification calls for primary land uses of offices, retail, high-density residences, and public uses, and supporting land uses of cultural facilities, civic spaces, offices, light manufacturing, and public spaces.

ZONING AMENDMENT TEST

The standard for accepting an amendment to the zoning map is that the proposed zoning action must either:

1) Further the goals and objectives of the comprehensive land use plan, or

❑ Comments **The rezoning request furthers the goals of the Comprehensive Plan as it allows for retail in a currently vacant space in a prominent downtown location.**

2) Show that the area has changed significantly since the adoption of the comprehensive land use plan

❑ Comments **Not Applicable**

3) Show that there was a mistake or error made in the original zoning of the property.

❑ Comments **Not Applicable**

APPLICATION REQUIREMENT PER §17-6-1 OF THE PUEBLO MUNICIPAL CODE

The applicant's name and address and the name and address of any person, firm or corporation represented by such applicant in the application

❑ Comments **The application contains the required information.**

The interest of the applicant and the interest of the person, firm or corporation represented by the applicant, be it legal, sales development, operation, or other interest.

❑ Comments **The application contains the required information.**

The nature of the amendment and a legal description of the property that would be affected by the amendment.

❑ Comments **The application contains the required information.**

A statement of the facts which the applicant believes justify the amendment; provided; however, that when any amendment changing the zoning map is requested, the following additional information shall be furnished:

❑ Comments **The application contains the required information.**

A general description of the proposed development to the distance which will be affected; such description including subjects of environmental effect, economic effect, and traffic effect, if any; and such description carried out in scope and detail to the extent needed to support the requested amendment and as may be required by the Planning and Zoning Commission.

❑ Comments **The application contains the required information.**

A tentative site plan showing proposed structures, uses, open spaces, facilities for parking and loading and arrangements for pedestrian and vehicular circulation.

❑ Comments **The application contains the required information.**

A statement of the proposed time schedule for beginning and completion of development.

❑ Comments **The application contains the required information.**

A statement reasonably indicating the applicant's economic responsibility and capability of accomplishing the development for which a zoning amendment is requested.

❑ Comments **The application contains the required information.**

CONTEXT OF ZONE DISTRICT REQUIREMENTS PER §17-4-51(a)(15) OF THE PMC:

Neighborhood Business (B-1) Zone District Standards:
Purpose. The standards of this district (B-1) are designed to retain and provide areas for the sale at retail of those convenience type goods and services required by the residents of the immediate neighborhood and for those outlets which by their nature create no nuisances and serve a trade territory of only one (1) neighborhood.

RECOMMENDED ACTION:
If the Planning and Zoning Commission makes the necessary findings of fact, a recommendation to City Council for approval of the rezone request is appropriate subject to the following condition:

1. The shared access and parking agreement between the applicant and Pueblo County must be finalized before presentation to City Council.

REFERRAL AGENCIES AND COMMENTS:

• City Public Works	No comment
• City Transportation	No comment
• City Law Department	No comment
• Southern Colorado Building Department	Southern Colorado Building Department currently has no objections or comments regarding the proposed application. The listed business type(s) on the application constitute a change in use/occupancy for this building and the project will be required to go through the commercial plan review process and routing process.
• City Fire Department	No comment
• City Wastewater	No comment from WW. No flow analysis is required since the building has functioned as a commercial use since 1999

	and the building footprint is not intended to be expanded per the detailed explanation provided by the applicant.
• City Stormwater	No comment
• City Parks and Recreation Department	No comment
• Xcel Energy	No comment
• Black Hills Energy	No comment
• CDOT	No comment

ATTACHMENTS:

A. Aerial Map
B. Zoning Map
C. Comprehensive Plan Map
D. Public Notice Photo
E. Rezoning Exhibit

A. Aerial Map



B. Zoning Map



C. Comprehensive Plan Map



D. Public Notice & Site Photos





Building frontage from 12th St.



Parking area included in rezoning



E. Rezoning Exhibit & F. Supporting Documents

Zoning Map Amendment Exhibit
Parcels: 0525416005 and 0525416010
Lots 9, 10, and 11, Block 11, County Addition
Address: 229 W 12th St, Pueblo, CO 81003
Existing Zoning: R-5
Proposed Zoning: B-1



Planning & Zoning Map Amendment Application

Please type or print clearly. Illegible applications will not be accepted. Case #: _____

Property Owner	
Name: Pueblo County	
Company: Pueblo County Government	
Address: 215 W 10th St. Pueblo, CO	Zip: 81003
Phone: ( )	Email: swearingenz@pueblocounty.us
Applicant	
Name: Micah Lorenc	
Company: Purple Mountain Holdings LLC	
Address: 4145 Jasperwood Ct., Colorado Springs, CO	Zip: 80920
Phone: (210) 417-8178	Email: micahlorenc@gmail.com
Person of Firm Representing Owner or Applicant	
Name: Micah Lorenc	
Company:	
Address:	Zip:
Phone: ( )	Email:
The applicant will be the primary contact unless otherwise noted.	

Project Location: (address or general description) 229 W 12th Street, Pueblo, Colorado

Legal Description: Lots 9, 10, and 11, Block 11, County Addition to the City of Pueblo, Colorado

Subdivision: 60 Central Acreage: 0.363

Existing Zone District: R-5	**Proposed Zone District:** B-1

Purpose of this Application:

- ☒ To permit development of the property not allowed under the existing zone district.
- ☐ To provide proper zone district in conjunction with the subdivision plan for the area.
- ☐ In conjunction with the Annexation petition to annex the property in a use different than the existing Pueblo County Zoning.
- ☐ Other (specify):_____

(Continue Next Page)

(Continued from previous page)

Statement of Facts:
Justifying the zone change request. Be specific; use additional sheets if necessary.

The 2022 Future Land Use Map designates the property as Downtown Mixed-Use. This designation supports a mix of retail, office, and residential uses within a pedestrian-oriented downtown setting. Rezoning to B-1 would align the zoning district with the adopted Future Land Use designation and facilitate small-scale commercial activity appropriate to the area.

Description of area surrounding proposed development:

The property is located within the broader downtown area and is surrounded by commercial and institutional uses. Buildings immediately to the north, east, and south are currently utilized for commercial purposes. The proposed B-1 zoning is compatible with the established land use pattern in the immediate area.

A general description of the proposed development to the distance which will be affected; such description including subjects of environmental effect, economic effect and traffic effect, if any; and such description carried out in scope and detail to the extent needed to support the requested amendment and as may be required by the Planning and Zoning Commission.

The applicant proposes to rehabilitate and adaptively reuse the existing historic structure for a small-format retail space (used bookstore & clothing resale) on two floors, with co-working space on the third floor. The project consists primarily of interior rehabilitation and is not expected to create significant environmental impacts, traffic increases, or high-intensity commercial activity.

☒ A tentative site plan showing proposed structures, uses, open spaces, facilities for parking and loading and arrangements for pedestrian and vehicular circulation.

Estimated date for beginning project: May 2026

Estimated date for completion of project: July 2026

A statement reasonably indicating the applicant's economic responsibility and capability of accomplishing the development for which a zoning amendment is requested.

The applicant is under contract to purchase the subject property from Pueblo County and is pursuing financing to complete the rehabilitation and adaptive reuse described in this application. The applicant has the financial capacity and organizational resources to undertake the project, including engagement with professional advisors.

❑ CD with DWF and DWG (Autocad) file of all plans and drawings & a PDF of all documents submitted. (**if applicable**)

By signing below, the Property Owner and Applicant are representing that each understands and agrees to the following terms:

1. Authorized personnel from the City of Pueblo, are hereby granted the right to enter the subject property for the purposes of reviewing and processing the application, including Certificate of Occupancy Inspections.
2. There are no known hazards or vicious animals present on the subject property.
3. All information contained in this application, is true and accurate to the best of my knowledge.
4. The City of Pueblo is under no obligation to approve the request contained in this application. No promises of approval are conveyed with the acceptance of this application.

Property Owner		
Print Name:	Zach Swearingen	
Signature:		Date: 3-12-2026
Applicant, if different from Property Owner		
Print Name:	Micah Lorenc	
Signature:		Date: 3/8/2026

Office Use Only

Zoning Compliance (Completed by City Staff)		
Application received by:	Date:	
Application checked for completeness by:	Date:	
Case Manager:	Fee Paid:	
Hearing date:	❑ Approved ❑ Denied ❑Approved w/conditions	

Detailed Explanation of Rezoning Request
229 W 12th Street – Pueblo, Colorado
Parcel No. 05-254-16-005 and 05-254-16-010

Detailed Explanation of Rezoning Request

The applicant requests a Zoning Map Amendment to rezone the property located at 229 W 12th Street (Parcel No. 05-254-16-005 and 05-254-16-010), legally described as Lots 9, 10, and 11, Block 11, County Addition to the City of Pueblo, from R-5 (Multi-Family Residential) to B-1 (Neighborhood Business).

The subject property consists of approximately 0.363 acres and is developed with an existing three-story historic masonry building that has recently functioned in non-residential capacities, including office and governmental use. No expansion of the building footprint or additional site development is proposed. The request is limited to aligning zoning with the intended neighborhood-scale commercial uses within the existing structure.

The proposed use includes small-scale neighborhood retail activity on the first and second floors, limited to a maximum of 3,250 square feet of gross floor area for retail use. Retail uses will be neighborhood-serving in nature and will not include regional draw uses, auto-oriented retail, outdoor display, outdoor storage, or high-intensity commercial activity. The third floor will be utilized as office/co-working space, which is permitted by right within the B-1 Zone District.

The property is located within the City's designated Downtown Mixed-Use future land use area. The requested B-1 zoning classification is consistent with this designation and supports neighborhood-serving commercial activity integrated within an established urban context. The building has functioned in non-residential capacities since 1999 and is not currently operating as multi-family residential. Additionally, the properties immediately north, east, and south of the subject site are developed with commercial or institutional uses, further demonstrating compatibility with the requested zoning designation.

No significant environmental impacts are anticipated, as the proposal involves adaptive reuse of the existing structure with no site expansion. Traffic impacts are expected to be minimal and consistent with typical neighborhood commercial activity. The site has existing access and ample established parking arrangements that will continue to serve the property.

Economically, the proposed rezoning will allow reinvestment into an existing historic structure, activation of currently underutilized space, and modest neighborhood-scale economic activity consistent with surrounding land uses. The request supports adaptive reuse rather than new development and promotes revitalization in the downtown Pueblo area.

For these reasons, the requested B-1 zoning designation is appropriate, compatible with surrounding uses, and consistent with the City's long-term planning objectives.

April 24, 2026

The City Planning and Zoning Commission will hold a public hearing on a request from Micah Lorenc for the approval of the following application:

Z-26-05 Rezone: Rezoning of 0.37 acres located at 229 W. 12th St. from Multiple Residential and Office District (R-5) Zone District to Neighborhood Business (B-1) Zone District.

The Planning and Zoning Commission meeting will be held on **May 13, 2026, at 3:30 p.m.** in City Council Chambers at 1 City Hall Place. The meeting will be recorded and can be viewed via Zoom, but **no testimony will be heard virtually** (Zoom info available at www.pueblo.us/PandZ).

You are welcome to attend this public hearing and express your viewpoint concerning this proposal. Written testimony can also be accepted up to 24 hours before the hearing date. To review the staff report for the proposed application, please visit www.pueblo.us/PandZ and click on "Most Recent Agenda" no sooner than the Friday prior to the hearing. **Please contact the planner listed below if you have questions**.

Beritt Odom, Planning & Community Development Director
By Mikaylin Hackley, Planner
(719) 553-2259

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Beritt Odom, Planning & Community Development Director
By Mikaylin Hackley, Planner
(719) 553-2259

CASE NUMBER: Z-26-05

CERTIFICATION

I hereby certify that I did this day cause written notice of the public hearing on the proposed Zoning Map Amendment of the property located at 229 W. 12th St.to be sent to the attached list of owners of the real property lying within three hundred (300) feet of the said property on which the Zoning Map Amendment is proposed by depositing the same properly addressed and postage paid in the post office, as set forth in the Code of Ordinances, Section 17-6-2.

April 24, 2026

PUEBLO PLANNING & ZONING COMMISSION

By: Cindy Capuchin

I hereby certify that I did this day verify and photograph the posted notice of the public hearing on the Zoning Map Amendment of the property located at 229 W. 12th St.. upon which action is pending as set forth in the Code of Ordinances, Section 17-6-2.

April 24, 2026
(Date)

PUEBLO PLANNING & ZONING COMMISSION

By: Cindy Capuchin

Owner	OwnerStree	OwnerCity	Own	OwnerZip
311 WEST 12TH LLC	311 W 12TH ST	PUEBLO	CO	81003-2812
BOYD ROBERT LYNN	313 W 12TH ST	PUEBLO	CO	81003-2812
CHONG WAI LOONG	1301 N MAIN ST	PUEBLO	CO	81003-3711
DEAN EMILY	315 W 12TH ST	PUEBLO	CO	81003-2812
GARCIA JESSIE K	1201 COURT ST	PUEBLO	CO	81003-2820
HART DALE J/HART CYNTHIA A	1496 3RD RD	PUEBLO W	CO	81007-1039
HART DALE J/HART CYNTHIA A	1496 3RD RD	PUEBLO W	CO	81007-1039
HEAD VICTOR G / BRUNER HEAD EMILY	315 W 12TH ST	PUEBLO	CO	81003-2812
IMPOSSIBLE PLAYERS INC	1201 N MAIN ST	PUEBLO	CO	81003-2827
KAGEY MARY ANN/KAGEY KEVIN E	5931 3R RD	BEULAH	CO	81023-9723
LAKE NACIEMIENTO LTD	200 S WILCOX ST PMB 1	CASTLE RO	CO	80104
MARYE JAMES A	307 W 12TH ST	PUEBLO	CO	81003-2812
MORESCHINI BROTHERS INC	2601 KACHINA DR	PUEBLO	CO	81008-1510
PUEBLO CHILD ADVOCACY CENTER I	301 W 13TH ST	PUEBLO	CO	81003-2701
PUEBLO COUNTY	215 W 10TH	PUEBLO	CO	81003-2945
PUEBLO MEDICAL LLC	20 LAMBRIG WAY	COLORADC	CO	80906-7962
PUEBLORADO VILLA PROFESSIONAL BUILDING LLC	1225 N MAIN STE 207 S	PUEBLO	CO	81003-2827
RAMOS MICHAEL	216 W 13TH ST	PUEBLO	CO	81003-3704
RIVERA ANGEL / RIVERA ANGELINA OTERO	4869 S SICILY ST	CENTENNI/	CO	80015-5551
SANDOVAL JOHN T	323 W ORMAN AVE	PUEBLO	CO	81004-1854
SCHOOL DIST NO 60	315 W 11TH ST	PUEBLO	CO	81003-2804
SENA JAMES M	3812 AUGUSTA LN	PUEBLO	CO	81001-4920
SILVER LINING HOLDINGS, LLC	44 MACARTHUR RD	PUEBLO	CO	81001-1777
TORRES JOHN M/HERNANDEZ PAMELA A	306 W 13TH ST	PUEBLO	CO	81003-2702
U M V + CO LLC	3833 AUGUSTA LN	PUEBLO	CO	81001-4920
VALLEJOS MICHAEL BERT	2019 ELMWOOD LN	PUEBLO	CO	81005-2549
VANDEBURGH BENJAMIN BRIAN / VANDEBURGH HEATHER ANN	223 W 13TH ST	PUEBLO	CO	81003-3703
WILSON DAVID/WILSON DIANE	309 W 13TH ST	PUEBLO	CO	81003-2701

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Greg Pedroza, Director Aviation

SUBJECT: AN ORDINANCE APPROVING AND ACCEPTING AIRPORT INFRASTRUCTURE GRANT (AIG) GRANT AGREEMENT NO. 3-08-0046-054-2026 FOR FUNDS IN THE AMOUNT OF $285,000 AND AIRPORT IMPROVEMENT PROGRAM (AIP) GRANT AGREEMENT NO. 3-08-0046-055-2026 FOR FUNDS IN THE AMOUNT OF $119,003 FROM THE UNITED STATES OF AMERICA ACTING THROUGH THE FEDERAL AVIATION ADMINISTRATION FOR COSTS RELATED TO THE PUB TAXIWAY A SEALCOAT (PHASE 1) PROJECT AT THE PUEBLO MEMORIAL AIRPORT, BUDGETING AND APPROPRIATING $404,003 TO PROJECT NO. AP2603 – PUB TAXIWAY A SEALCOAT, AND AUTHORIZING THE MAYOR TO EXECUTE SAME

SUMMARY:

This Ordinance will approve and accept an Airport Infrastructure Grant (AIG) grant agreement and an Airport Improvement Program (AIP) grant agreement from the United States of America acting through the Federal Aviation Administration (FAA) to provide funding for costs related to the PUB Taxiway A Sealcoat (Phase 1) project.

PREVIOUS COUNCIL ACTION:

Resolution 16263, approved March 9, 2026, established Project No. AP2603 – PUB Taxiway A Sealcoat, transferring unused funds from previous projects for grant matching.

Ordinance 11155, approved April 30, 2026, approved a sub-agreement to Dibble and Associates Consulting Engineers, Inc., for the design, bid, and construction administration.

BACKGROUND:

The Colorado Department of Transportation (CDOT) Aeronautics Division conducted a pavement condition assessment for Taxiway A, and it was determined that Taxiway A

from Runway 35/17 to Taxiway A10 is due for sealcoat maintenance. This project is on the Capital Improvement Plan schedule for 2026, approved by both the FAA and CDOT grant funds.

The Federal Aviation Administration awarded the Pueblo Memorial Airport two separate grants that will, in total, cover 95% of project costs.

FINANCIAL IMPLICATIONS:

The total estimated project cost for PUB Taxiway A sealcoat (Phase 1) is $425,266.32. FAA AIG Grant for $285,000 will cover 71% of the obligated 95% of total project costs, and FAA AIP Grant for $119,003 will cover the remaining 29% of the obligated 95% of total project costs. CDOT's 2.5% matching funds and the City of Pueblo's 2.5% matching funds were budged and appropriated in previous ordinances.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If this Ordinance is not approved, the grants will not be accepted from the federal government and the project will not occur.

RECOMMENDATION:

Approve the Ordinance.

ATTACHMENTS:

1. PUB-NMG-3-08-0046-055-2026-Grant Agreement
2. PUB-NMG-3-08-0046-054-2026-Grant Agreement

ORDINANCE NO.

AN ORDINANCE APPROVING AND ACCEPTING AIRPORT INFRASTRUCTURE GRANT (AIG) GRANT AGREEMENT NO. 3-08-0046-054-2026 FOR FUNDS IN THE AMOUNT OF $285,000 AND AIRPORT IMPROVEMENT PROGRAM (AIP) GRANT AGREEMENT NO. 3-08-0046-055-2026 FOR FUNDS IN THE AMOUNT OF $119,003 FROM THE UNITED STATES OF AMERICA ACTING THROUGH THE FEDERAL AVIATION ADMINISTRATION FOR COSTS RELATED TO THE PUB TAXIWAY A SEALCOAT (PHASE 1) PROJECT AT THE PUEBLO MEMORIAL AIRPORT, BUDGETING AND APPROPRIATING $404,003 TO PROJECT NO. AP2603 – PUB TAXIWAY A SEALCOAT, AND AUTHORIZING THE MAYOR TO EXECUTE SAME

WHEREAS, the City of Pueblo has received two Grant Agreements from the Federal Aviation Administration (FAA) for costs related to the Taxiway A Sealcoat (Phase 1) project; and,

WHEREAS, the funds from these grants need to be budgeted and appropriated into Project No. AP2603 – Taxiway A Sealcoat; NOW, THEREFORE

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The Federal Aviation Administration Airport Infrastructure Grant Agreement No. 3-08-0046-054-2026 (“Grant Agreement”), a true copy of which is attached hereto and made a part hereof by reference, by and between the City of Pueblo, a Municipal Corporation, and the United States of America through the Federal Aviation Administration (“FAA”), making available $285,000.00 in federal funds for costs related to the PUB Taxiway A Sealcoat (Phase 1) project, after having been approved as to form by the City Attorney, is here by accepted and approved.

The Federal Aviation Administration Airport Improvement Program Grant Agreement No. 3-08-0046-055-2026 (“Grant Agreement”), a true copy of which is attached hereto and made a part hereof by reference, by and between the City of Pueblo, a Municipal Corporation, and the United States of America through the Federal Aviation Administration (“FAA”), making available $119,003.00 in federal funds for costs related to the PUB Taxiway A Sealcoat (Phase 1) project, after having been approved as to form by the City Attorney, is here by accepted and approved.

SECTION 2.

The Mayor is hereby authorized to execute both Grant Agreements in the name and on behalf of the City of Pueblo, where the Mayor may execute the Grant Agreement by electronic signature and such electronic signature shall be attributable to the Mayor and the City of Pueblo.

SECTION 3.

Funds in the amount of $285,000.00 shall be accepted pursuant to the Grant Agreement and budgeted and appropriated to Project No. AP2603 – PUB Taxiway A Sealcoat.

Funds in the amount of $119,003.00 shall be accepted pursuant to the Grant Agreement and budgeted and appropriated to Project No. AP2603 – PUB Taxiway A Sealcoat.

SECTION 4.

Pursuant to the Grant Agreement, the FAA may propose amendments to the grant terms and its obligations thereunder. Administrative amendments, including but not limited to changes to the project schedule, scope clarifications that do not alter the substantive work to be performed, and compliance updates, may be accepted on behalf of the City by the Mayor or the Director of Aviation without further action by City Council, provided that such administrative amendments do not increase or decrease the maximum grant obligation or the City's matching fund requirement. Any amendment that would increase or decrease the maximum grant obligation, or that would alter the City's matching fund requirement, shall be submitted to City Council for acceptance by separate ordinance in accordance with Section 3-17 of the Pueblo City Charter, and any increase in funding shall be appropriated by separate ordinance in accordance with Section 7-14 of the Pueblo City Charter.

SECTION 5.

The officers and staff of the City are authorized to perform any and all acts consistent with this Ordinance to implement the policies and procedures described herein.

SECTION 6.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

U.S. Department of Transportation Federal Aviation Administration

Airports Division Northwest Mountain Region Colorado, Utah, Wyoming

Denver Airports District Office: 26805 E 68th Ave, Ste 224 Denver, CO 80249-6339

{{DateTime_es_:signer1:calc(now()):format(date," mmmm d, yyyy")}}

The Honorable Heather Graham
Mayor, City of Pueblo
1 City Hall Place
Pueblo, Colorado 81003

Dear Mayor Graham:

The Grant Offer for Airport Improvement Program (AIP) Project No. 3-08-0046-055-2026 at Pueblo Memorial Airport is attached for execution. This letter outlines the steps you must take to properly enter into this agreement and provides other useful information. Please read the conditions, special conditions, and assurances that comprise the Grant Offer carefully.

You may not make any modification to the text, terms or conditions of the Grant Offer.

***Steps You Must Take to Enter Into Agreement*.**

To properly enter into this agreement, you must do the following:

1. The governing body must give authority to execute the grant to the individual(s) signing the grant, i.e., the person signing the document must be the sponsor's authorized representative(s) (hereinafter "authorized representative").
2. The authorized representative must execute the grant by adding their electronic signature to the appropriate certificate at the end of the agreement.
3. Once the authorized representative has electronically signed the grant, the sponsor's attorney(s) will automatically receive an email notification.
4. On the **same day or after** the authorized representative has signed the grant, the sponsor's attorney(s) will add their electronic signature to the appropriate certificate at the end of the agreement.
5. If there are co-sponsors, the authorized representative(s) and sponsor's attorney(s) must follow the above procedures to fully execute the grant and finalize the process. Signatures must be obtained and finalized no later than **July 24, 2026**.
6. The fully executed grant will then be automatically sent to all parties as an email attachment.

Payment. Subject to the requirements in 2 CFR § 200.305 (federal payment), each payment request for reimbursement under this grant must be made electronically via the Delphi eInvoicing System. Please see the attached Grant Agreement for more information regarding the use of this system.

Project Timing. The terms and conditions of this agreement require you to complete the project without undue delay and no later than the Period of Performance end date four (4) years from the grant

execution date). We will be monitoring your progress to ensure proper stewardship of these federal funds. We expect you to submit payment requests for reimbursement of allowable incurred project expenses consistent with project progress. Your grant may be placed in "inactive" status if you do not make draws on a regular basis, which will affect your ability to receive future Grant Offers. Costs incurred after the Period of Performance ends are generally not allowable and will be rejected unless authorized by the FAA in advance.

Reporting. Until the grant is completed and closed, you are responsible for submitting formal reports as follows:

- For all grants, you must submit by December 31st of each year this grant is open:
  1. A signed/dated SF-270 (Request for Advance or Reimbursement for non-construction projects) or SF-271 or equivalent (Outlay Report and Request for Reimbursement for Construction Programs), and
  2. An SF-425 (Federal Financial Report).
- For non-construction projects, you must submit FAA Form 5100-140, Performance Report within 30 days of the end of the federal fiscal year.
- For construction projects, you must submit FAA Form 5370-1, Construction Progress and Inspection Report, within 30 days of the end of each federal fiscal quarter.

Audit Requirements. As a condition of receiving federal assistance under this award, you must comply with audit requirements as established under 2 CFR Part 200. Subpart F requires non-federal entities that expend $1,000,000 or more in federal awards to conduct a single or program specific audit for that year. Note that this includes federal expenditures made under other federal-assistance programs. Please take appropriate and necessary action to ensure your organization will comply with applicable audit requirements and standards.

Closeout. Once the project(s) is completed and all costs are determined, we ask that you work with your FAA contact indicated below to close the project without delay and submit the necessary final closeout documentation as required by your Region/Airports District Office.

FAA Contact Information. Paulette Lugo, (303) 342-1256, paulette.lugo@faa.gov is the assigned program manager for this grant and is readily available to assist you and your designated representative with the requirements stated herein.

We sincerely value your cooperation in these efforts and look forward to working with you to complete this important project.

Sincerely,

{{Sig_es_:signer1: signature}}

Jesse A. Lyman
Manager, Denver Airports District Office

U.S. Department of Transportation Federal Aviation Administration

FEDERAL AVIATION ADMINISTRATION

FY 2026

AIRPORT IMPROVEMENT PROGRAM (AIP) GRANT AGREEMENT

Part I - Offer

Federal Award Offer Date	**{{DateTime_es_:signer1:calc(now()):format(date," mmmm d, yyyy")}}**
Airport/Planning Area	Pueblo Memorial Airport
Airport Grant Number	3-08-0046-055-2026 [Contract No. DOT-FA26NM-1077]
Unique Entity Identifier	NJK3BNUDRHJ7

TO: City of Pueblo, Colorado

(herein called the "Sponsor") (For Co-Sponsors, list all Co-Sponsor names. The word "Sponsor" in this Grant Agreement also applies to a Co-Sponsor.)

FROM: **The United States of America** (acting through the Federal Aviation Administration, herein called the "FAA")

WHEREAS, the sponsor has submitted to the FAA a Project Application dated January 16, 2026, for a grant of federal funds for a project at or associated with the Pueblo Memorial Airport, which is included as part of this Grant Agreement; and

WHEREAS, the FAA has approved a project for the Pueblo Memorial Airport (herein called the "Project") consisting of the following:

Reseal Taxiway A, C, and D (about 29% of Total Project)

which is more fully described in the Project Application.

NOW THEREFORE, Pursuant to and for the purpose of carrying out Title 49, United States Code (USC), Chapters 471 and 475; 49 USC §§ 40101 et seq. and 48103; Consolidated Appropriations Act, 2024 (Public Law Number (P.L.) 118-42); Consolidated Appropriations Act, 2025 (P.L. 119-4); Consolidated Appropriations Act, 2026 (P.L. 119-75); FAA Reauthorization Act of 2024 (P.L. 118-63); Infrastructure

Investment and Jobs Act of 2021 (IIJA) (P.L. 117-58) (as applicable); and the representations contained in the Project Application; and in consideration of: (a) the sponsor's adoption and ratification of the most recently published Grant Assurances; (b) the sponsor's acceptance of this offer; and (c) the benefits to accrue to the United States and the public from the accomplishment of the project, and compliance with the Grant Assurance and conditions as herein provided;

THE FEDERAL AVIATION ADMINISTRATION, FOR AND ON BEHALF OF THE UNITED STATES, HEREBY OFFERS AND AGREES to pay (95) % of the allowable costs incurred accomplishing the Project as the United States' share of the Project.

Assistance Listings Number(s): 20.116**.**

This Offer is made on and SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

CONDITIONS

1. **Maximum Obligation.** The maximum obligation of the United States payable under this Offer is $119,003.

   The following amounts represent a breakdown of the maximum obligation for the purpose of establishing allowable amounts for any future grant amendment, which may increase the foregoing maximum obligation of the United States under the provisions of 49 USC § 47108(b):
   $0 for planning
   $119,003 for airport development or noise program implementation; and,
   $0 for land acquisition.

2. **Grant Performance.** This agreement is subject to the following federal award requirements:

   a. Period of Performance:

      i. Start Date: The date the recipient formally accepts this agreement and the date signed by the last signatory to the agreement.

      ii. End Date: Four (4) years to the calendar day from the date of acceptance.

      iii. Extension of the Period of Performance (PoP): The recipient may request a one-time extension of up to one year after the PoP end date by submitting a request to the FAA. The request must include, at a minimum, supporting justification for the request and the amount of additional time requested. The request must be submitted at least 10 calendar days before the PoP end date. This one-time extension may not be exercised for the sole purpose of using unobligated balances.

      The PoP end date, or any extension as approved by FAA, shall not affect, relieve, or reduce recipient obligations and assurances that extend beyond the closeout of this agreement.

   b. Budget Period:

      i. For a single year grant offer, the budget period follows the same start and end date as the PoP provided in paragraph 2(a), and any extension of the PoP end date.

      ii. For a multi-year grant offer, per the authority provided in 49 USC § 47108 and § 47114, the budget period is from the initial PoP start date through the end of the final fiscal year identified on a multi-year grant offer (See Multi-Year Grant Special Condition, if applicable).

   c. Appropriation Period of Availability and Expenditure:

i. The FAA must obligate appropriated funds within the period of availability identified in the appropriation.

ii. In accordance with 31 USC § 1552, by September 30th of the fifth fiscal year after the period of availability, FAA must liquidate and close expired appropriations, and any remaining balance (whether obligated or unobligated) must be canceled and thereafter shall not be available for obligation or expenditure for any purpose.

iii. IIJA and Supplemental AIP funding are subject to this condition.

d. Close Out:

Recipients shall begin the closeout process upon physical completion of the project(s) identified in this agreement. Closeout shall proceed expeditiously and without delay, even if the PoP end date has not been reached. In accordance with 2 Code of Federal Regulations (CFR) 200, unless the FAA authorizes a written extension, the recipient must submit all grant closeout documentation and liquidate (pay-off) all obligations incurred under this award no later than 120 calendar days after the PoP end date. If the recipient does not submit all required closeout documentation within this period, the FAA will proceed to close out the grant within one year of the PoP end date with the information available at the end of 120 days.

e. Termination:

The FAA may terminate this agreement and all of its obligations under this agreement if any of the following occur:

i. The recipient fails to comply with the terms and conditions of this agreement;

ii. The recipient fails to obtain or provide any recipient grant contribution as required by the agreement;

iii. There is a material failure to comply with the Project Schedule even if it is beyond the reasonable control of the recipient;

iv. Any project changes that the FAA determines are inconsistent with the FAA's basis for selecting the project to receive a grant;

v. Continued grant payment inactivity, generally defined as no drawdowns over a 12-month period;

vi. The recipient requests that the FAA terminate the agreement under this section; or

vii. The FAA determines that termination of this agreement is in the public interest.

In terminating this agreement under this section, the FAA may elect to consider only the interests of the FAA.

3. Ineligible or Unallowable Costs. In accordance with 49 USC § 47110, the sponsor is prohibited from including any costs in the grant funded portions of the project that the FAA has determined to be ineligible or unallowable, including costs incurred to carry out airport development implementing policies and initiatives repealed by Executive Order 14148, provided such costs are not otherwise permitted by statute.

4. Indirect Costs - Sponsor. The sponsor may charge indirect costs under this award by applying the indirect cost rate identified in the project application, as accepted by the FAA, to allowable costs for sponsor direct salaries and wages.

5. **Determining the Final Federal Share of Costs.** The United States' share of allowable project costs will be made in accordance with 49 USC § 47109, the regulations, policies, and procedures of the Secretary of Transportation ("Secretary"), and any superseding legislation. Final determination of the United States' share will be based upon the final audit of the total amount of allowable project costs, and settlement will be made for any upward or downward adjustments to the federal share of costs.

6. **Completing the Project Without Delay and in Conformance with Requirements.** The sponsor must carry out and complete the project without undue delay, and in accordance with this agreement, 49 USC Chapters 471 and 475, IIJA (P.L. 117-58) (as appropriate), and the regulations, policies, and procedures of the Secretary. Per 2 CFR § 200.308, the sponsor agrees to report and request prior FAA approval for any disengagement from performing the project that exceeds three months, or a 25 percent reduction in time devoted to the project. The report must include a reason for the project stoppage. The sponsor also agrees to comply with the grant assurances, which are part of this agreement.

7. **Amendments or Withdrawals before Grant Acceptance.** The FAA reserves the right to amend or withdraw this offer at any time prior to its acceptance by the sponsor.

8. **Offer Expiration Date.** This offer will expire and the United States will not be obligated to pay any part of the costs of the project(s) unless this offer has been accepted by the sponsor on or before July 24, 2026, or such subsequent date as may be prescribed in writing by the FAA.

9. **Improper Use of Federal Funds and Mandatory Disclosure.**

   a. The sponsor must take all steps, including litigation, if necessary, to recover federal funds spent fraudulently, wastefully, or in violation of federal antitrust statutes, or misused in any other manner for any project upon which federal funds have been expended. For the purposes of this grant agreement, the term "federal funds" means funds however used or dispersed by the sponsor, that were originally paid pursuant to this or any other federal grant agreement. The sponsor must obtain the approval of the Secretary as to any determination of the amount of the federal share of such funds. The sponsor must return the recovered federal share, including funds recovered by settlement, order, or judgment, to the Secretary. Upon request, the sponsor must furnish to the Secretary all documents and records pertaining to the determination of the amount of the federal share, or to any settlement, litigation, negotiation, or other efforts taken to recover such funds. All settlements or other final positions of the sponsor, in court or otherwise, involving the recovery of such federal share require advance approval by the Secretary.

   b. The sponsor, a recipient, and a subrecipient under this federal grant must promptly comply with the mandatory disclosure requirements as established under 2 CFR § 200.113, including reporting requirements related to recipient integrity and performance in accordance with Appendix XII to 2 CFR Part 200.

10. **United States Not Liable for Damage or Injury.** The United States is not responsible or liable for damage to property or injury to persons which may arise from, or be incident to, compliance with this agreement.

11. **System for Award Management (SAM) Registration and Unique Entity Identifier (UEI).**

   a. Requirement for System for Award Management (SAM): Unless the sponsor is exempted from this requirement under 2 CFR § 25.110, the sponsor must maintain the currency of its information in the SAM until the sponsor submits the final financial report required under this

grant, or receives the final payment, whichever is later. This requires that the sponsor review and update the information at least annually after the initial registration and more frequently if required by changes in information or another award term. Additional information about registration procedures may be found at the SAM website (currently at http://www.sam.gov).

b. Unique entity identifier (UEI) means a 12-character alpha-numeric value used to identify a specific commercial, nonprofit, or governmental entity. A UEI may be obtained from SAM.gov at https://sam.gov/content/entity-registration.

12. **Electronic Grant Payment(s).** Unless otherwise directed by the FAA, the sponsor must make each payment request under this agreement electronically via the Delphi eInvoicing System for Department of Transportation (DOT) Financial Assistance Awardees.

13. **Informal Letter Amendment of Projects.** If, during the life of the project, the FAA determines that the maximum grant obligation of the United States exceeds the expected needs of the sponsor by $25,000 or five percent, whichever is greater, the FAA can issue a letter amendment to the sponsor unilaterally reducing the maximum obligation.

    The FAA can also issue a letter to the sponsor increasing the maximum obligation if there is an overrun in the total actual eligible and allowable project costs to cover the amount of the overrun, provided it will not exceed the statutory limitations for grant amendments. The FAA's authority to increase the maximum obligation does not apply to the "planning" component of Condition No. 1, Maximum Obligation.

    The FAA can also issue an informal letter amendment that modifies the grant description to correct administrative errors or to delete work items if the FAA finds it advantageous, and in the best interests of the United States.

    An informal letter amendment has the same force and effect as a formal grant amendment.

14. **Environmental Standards.** The sponsor is required to comply with all applicable environmental standards, as further defined in the Grant Assurances, for all projects in this grant. If the sponsor fails to comply with this requirement, the FAA may suspend, cancel, or terminate this Grant Agreement.

15. **Financial Reporting and Payment Requirements.** The sponsor will comply with all federal financial reporting requirements and payment requirements, including submittal of timely and accurate reports.

16. **Buy American.** Unless otherwise approved in advance by the FAA, in accordance with 49 USC § 50101, the sponsor will not acquire or permit any contractor or subcontractor to acquire any steel or manufactured goods produced outside the United States to be used for any project for which funds are provided under this grant. The sponsor will include a provision implementing Buy American in every contract and subcontract awarded under this grant.

17. **Build America, Buy America.** The sponsor must comply with the requirements under the Build America, Buy America Act (P.L. 117-58).

18. **Maximum Obligation Increase.** In accordance with 49 USC § 47108(b)(2), as amended, the maximum obligation of the United States, as stated in Condition No. 1, Maximum Obligation, of this grant:

    a. May not be increased for a planning project;

    b. May be increased by not more than 15 percent for development projects, if funds are available;

c. May be increased by not more than the greater of the following for a land project, if funds are available:

i. 15 percent; or

ii. 25 percent of the total increase in allowable project costs attributable to acquiring an interest in the land.

If the sponsor requests an increase, any eligible increase in funding will be subject to the United States Government share as provided in 49 USC § 47109, or IIJA (P.L. 17-58), or other superseding legislation if applicable, for the fiscal year appropriation with which the increase is funded. The FAA is not responsible for the same federal share provided herein for any amount increased over the initial grant amount. The FAA may adjust the federal share as applicable through an informal letter of amendment.

19. Audits for Sponsors.

PUBLIC SPONSORS. The sponsor must provide for a Single Audit or program-specific audit in accordance with 2 CFR Part 200. The sponsor must submit the audit reporting package to the Federal Audit Clearinghouse on the Federal Audit Clearinghouse's Internet Data Entry System at http://harvester.census.gov/facweb/. Upon request of the FAA, the sponsor shall provide one copy of the completed audit to the FAA. Sponsors that expend less than $1,000,000 in federal awards and are exempt from federal audit requirements must make records available for review or audit by the appropriate federal agency officials, state, and Government Accountability Office. The FAA and other appropriate federal agencies may request additional information to meet all federal audit requirements.

20. Suspension or Debarment. When entering into a "covered transaction" as defined by 2 CFR § 180.200, the sponsor must:

a. Verify the non-federal entity is eligible to participate in this federal program by:

i. Checking the System for Award Management (SAM.gov) exclusions to determine if the non-federal entity is excluded or disqualified; or

ii. Collecting a certification statement from the non-federal entity attesting they are not excluded or disqualified from participating; or

iii. Adding a clause or condition to covered transactions attesting the individual or firm are not excluded or disqualified from participating.

b. Require prime contractors to comply with 2 CFR § 180.330 when entering into lower-tier transactions with their contractors and sub-contractors.

c. Immediately disclose in writing to the FAA whenever (1) the sponsor learns they have entered into a covered transaction with an ineligible entity or (2) the public sponsor suspends or debars a contractor, person, or entity.

21. Ban on Texting While Driving.

a. In accordance with Executive Order 13513, Federal Leadership on Reducing Text Messaging While Driving, October 1, 2009, and DOT Order 3902.10, Text Messaging While Driving, December 30, 2009, the sponsor is encouraged to:

i. Adopt and enforce workplace safety policies to decrease crashes caused by distracted drivers, including policies to ban text messaging while driving when performing any work

for, or on behalf of, the Federal Government, including work relating to a grant or subgrant.

ii. Conduct workplace safety initiatives in a manner commensurate with the size of the business, such as:

a) Establishment of new rules and programs or re-evaluation of existing programs to prohibit text messaging while driving; and

b) Education, awareness, and other outreach to employees about the safety risks associated with texting while driving.

f. The sponsor must insert the substance of this clause on banning texting while driving in all subgrants, contracts, and subcontracts funded with this grant.

22. Trafficking in Persons.

a. *Posting of contact information.*

i. The sponsor must post the contact information of the national human trafficking hotline (including options to reach out to the hotline such as through phone, text, or TTY) in all public airport restrooms.

b. *Provisions applicable to a sponsor that is a private entity.*

i. Under this grant, the sponsor, its employees, subrecipients under this grant, and subrecipient's employees must not engage in:

a) Severe forms of trafficking in persons;

b) The procurement of a commercial sex act during the period of time that the grant or cooperative agreement is in effect;

c) The use of forced labor in the performance of this grant; or any subaward; or

d) Acts that directly support or advance trafficking in persons, including the following acts:

1. Destroying, concealing, removing, confiscating, or otherwise denying an employee access to that employee's identity or immigration documents;

2. Failing to provide return transportation of pay for return transportation costs to an employee from a country outside the United States to the country from which the employee was recruited upon the end of employment if requested by the employee, unless:

a. Exempted from the requirement to provide or pay for such return transportation by the federal department or agency providing or entering into the grant; or

b. The employee is a victim of human trafficking seeking victim services or legal redress in the country of employment or witness in a human trafficking enforcement action;

3. Soliciting a person for the purpose of employment, or offering employment, by means of materially false or fraudulent pretenses, representations, or promises regarding that employment;

4. Charging recruited employees a placement or recruitment fee; or
5. Providing or arranging housing that fails to meet the host country's housing and safety standards.

ii. The FAA may unilaterally terminate this grant or take any remedial actions authorized by 22 USC § 7104b(c), without penalty, if any private entity under this grant:

a) is determined to have violated a prohibition in paragraph 2.a. (PoP) of this grant; or

b) has an employee that is determined to have violated a prohibition in paragraph 2.a. (PoP) of this grant through conduct that is either:

1. Associated with the performance under this grant; or
2. Imputed to the recipient or the subrecipient using the standards and due process for imputing the conduct of an individual to an organization that are provided in 2 CFR Part 180, "OMB Guidelines to Agencies on Government-wide Debarment and Suspension (Nonprocurement)," as implemented by the FAA at 2 CFR Part 1200.

c. *Provisions applicable to a sponsor other than a private entity.*

i. The FAA may unilaterally terminate this award or take any remedial actions authorized by 22 USC § 7104b(c), without penalty, if subrecipient is a private entity under this grant:

a) is determined to have violated a prohibition in paragraph 2.a. (PoP) of this grant or

b) has an employee that is determined to have violated a prohibition in paragraph 2.a. (PoP) of this grant through conduct that is either:

1. Associated with the performance under this grant; or
2. Imputed to the sponsor or subrecipient using the standards and due process for imputing the conduct of an individual to an organization that are provided in 2 CFR Part 180, "OMB Guidelines to Agencies on Government-wide Debarment and Suspension (Nonprocurement)," as implemented by the FAA at 2 CFR Part 1200.

d. Provisions applicable to any sponsor or subrecipient.

i. The sponsor or subrecipient must inform the FAA and the DOT Inspector General immediately of any information you receive from any source alleging a violation of a prohibition in paragraph 2.a. (PoP) of this grant.

ii. The FAA's right to unilaterally terminate this grant as described in paragraphs 2.b. (Budget Period) or 3.a. (Close Out and Termination) of this grant, implements the requirements of 22 USC Chapter 78, and is in addition to all other remedies for noncompliance that are available to the FAA under this grant.

iii. The sponsor must include the requirements of paragraph 2.a. (PoP) of this grant award term in any subaward it makes to a private entity.

iv. If applicable, the sponsor must also comply with the compliance plan and certification requirements in 2 CFR § 175.105(b).

e. *Definitions. For purposes of this grant award, term:*

i. "Employee" means either:

a) An individual employed by the sponsor or a subrecipient who is engaged in the performance of the project or program under this grant; or

b) Another person engaged in the performance of the project or program under this grant and not compensated by the sponsor or a subrecipient including, but not limited to, a volunteer or individual whose services are contributed by a third party as an in-kind contribution toward cost sharing requirements.

ii. "Private Entity" means:

a) Any entity, including for-profit organizations, nonprofit organizations, institutions of higher education, and hospitals. The term does not include foreign public entities, Indian Tribes, local governments, or states as defined in 2 CFR § 200.1.

b) The terms "severe forms of trafficking in persons," "commercial sex act," "sex trafficking," "abuse or threatened abuse of law or legal process," "coercion," "debt bondage," and "involuntary servitude" have the meanings given at section 103 of the Victims of Trafficking and Violence Protection Act of 2000, as amended (22 USC § 7102).

23. Grant Funded Work Included in a PFC Application. Within 120 days of acceptance of this Grant Agreement, the sponsor must submit to the FAA an amendment to any approved Passenger Facility Charge (PFC) application that contains an approved PFC project also covered under this Grant Agreement as described in the project application. The sponsor may not make any expenditure under this Grant Agreement until project work addressed under this Grant Agreement is removed from an approved PFC application by amendment.

24. Exhibit "A" Property Map. The Exhibit "A" Property Map dated January 6, 2022, is incorporated herein by reference, or is submitted with the project application and made part of this Grant Agreement.

25. Employee Protection from Reprisal. In accordance with 2 CFR § 200.217 and 41 USC § 4701, an employee of a grantee, subgrantee contractor, recipient, or subrecipient must not be discharged, demoted, or otherwise discriminated against as a reprisal for disclosing to a person or body described in 41 USC § 4712(a)(2) information that the employee reasonably believes is evidence of gross mismanagement of a federal contract or grant, a gross waste of federal funds, an abuse of authority relating to a federal contract or grant, a substantial and specific danger to public health or safety, or a violation of law, rule, or regulation related to a federal contract (including the competition for or negotiation of a contract) or grant. The grantee, subgrantee, contractor, recipient, or subrecipient must inform their employees in writing of employee whistleblower rights and protections under 41 USC § 4712. See statutory requirements for whistleblower protections at 10 USC § 4701, 41 USC § 4712, 41 USC § 4304, and 10 USC § 4310.

26. Prohibited Telecommunications and Video Surveillance Services and Equipment. The sponsor agrees to comply with mandatory standards and policies relating to use and procurement of certain telecommunications and video surveillance services or equipment in compliance with the National Defense Authorization Act [P.L. 115-232 § 889] and 2 CFR § 200.216.

27. **Critical Infrastructure Security and Resilience.** The sponsor acknowledges that it has considered and addressed physical and cybersecurity and resilience in its project planning, design, and oversight, as determined by the DOT and the Department of Homeland Security (DHS). For airports that do not have specific DOT or DHS cybersecurity requirements, the FAA encourages the voluntary adoption of the cybersecurity requirements from the Transportation Security Administration and Federal Security Director identified for security risk Category X airports.

28. **Title VI of the Civil Rights Act.** As a condition of a grant award, the sponsor shall demonstrate that it complies with the provisions of Title VI of the Civil Rights Act of 1964 (42 USC §§ 2000d et seq.) and implementing regulations (49 CFR Part 21), the Airport and Airway Improvement Act of 1982 (49 USC § 47123), the Age Discrimination Act of 1975 (42 USC § 6101 et seq.), Section 504 of the Rehabilitation Act of 1973 (29 USC § 794 et seq.), the Americans with Disabilities Act of 1990 (42 USC § 12101, et seq.), U.S. Department of Transportation and Federal Aviation Administration (FAA) Assurances, and other relevant civil rights statutes, regulations, or authorities, including any amendments or updates thereto. This may include, as applicable, providing a current Title VI Program Plan to the FAA for approval, in the format and according to the timeline required by the FAA, and other information about the communities that will be benefited and impacted by the project. The sponsor shall affirmatively ensure that when carrying out any project supported by this grant that it complies with all federal nondiscrimination and civil rights laws based on race, color, national origin, sex, creed, age, disability, and genetic information, in consideration for federal financial assistance. The Department's and FAA's Office of Civil Rights may provide resources and technical assistance to recipients to ensure full and sustainable compliance with federal civil rights requirements. Failure to comply with civil rights requirements will be considered a violation of the agreement or contract and be subject to any enforcement action as authorized by law.

29. **Applicable Federal Anti-Discrimination Laws.** The sponsor agrees:

    a. That its compliance in all respects with all applicable federal anti-discrimination laws is material to the government's payment decisions for purposes of 31 USC § 3729(b)(4) and

    b. To certify that it does not operate any programs promoting Diversity, Equity, and Inclusion (DEI) that violate any applicable federal anti-discrimination laws.

30. **National Airspace System Requirements.**

    a. The sponsor shall cooperate with FAA activities installing, maintaining, replacing, improving, or operating equipment and facilities in or supporting the National Airspace System, including waiving permitting requirements and other restrictions affecting those activities to the maximum extent possible, and assisting the FAA in securing waivers of permitting or other restrictions from other authorities. The sponsor shall not take actions that frustrate or prevent the FAA from installing, maintaining, replacing, improving, or operating equipment and facilities in or supporting the National Airspace System.

    b. If FAA determines that the sponsor has violated subsection a., the FAA may impose a remedy, including:

        i. Additional conditions on the award;

        ii. Consistent with 49 USC Chapter 471, any remedy permitted under 2 CFR §§ 200.339–200.340, including withholding of payments; disallowance of previously reimbursed costs, requiring refunds from the recipient to the DOT; suspension or termination of the award; or suspension and debarment under 2 CFR part 180; or

iii. Any other remedy legally available.

c. In imposing a remedy under this condition, the FAA may elect to consider the interests of only the FAA.

d. The sponsor acknowledges that amounts that the FAA requires the sponsor to refund to the FAA due to a remedy under this condition constitute a debt to the Federal Government that the FAA may collect under 2 CFR 200.346 and the Federal Claims Collection Standards (31 CFR Parts 900–904).

31. Signage Costs for Construction Projects. The sponsor agrees that it will require the prime contractor of a federally-assisted airport improvement project to post signs consistent with a DOT/FAA-prescribed format, as may be requested by the DOT/FAA, and further agrees to remove any signs posted in response to requests received prior to February 1, 2025.

SPECIAL CONDITIONS

32. Solid Waste Recycling Plan. The sponsor certifies that it has a solid waste recycling plan as part of an existing Airport Master Plan, as prescribed by 49 USC § 47106(a)(6).

33. Maintenance Project Life. The sponsor agrees that pavement maintenance is limited to those aircraft pavements that are in sound condition that they do not warrant extensive work, such as reconstruction or overlays in the immediate or near future. The sponsor further agrees that AIP, Airport Infrastructure Grant (AIG), or supplemental appropriation funding for the pavements maintained under this project will not be requested for more substantial type rehabilitation (more substantial than periodic maintenance) for a 5-year period following the completion of this project unless the FAA determines that the rehabilitation or reconstruction is required for safety reasons.

34. Buy American Executive Orders. The sponsor agrees to abide by applicable Executive Orders in effect at the time this Grant Agreement is executed, including Executive Order 14005, Ensuring the Future Is Made in All of America by All of America's Workers.

35. Usable Unit of Development. The FAA and the sponsor agree this grant only funds a portion of the overall project. The FAA makes no commitment of funding beyond what is provided herein. In accepting this award, the sponsor understands and agrees that the work described in this Grant Agreement must be incorporated into a safe, useful, and usable unit of development completed within a reasonable timeframe [49 USC § 47106(a)(4)]. This safe, useful, usable unit of development must be completed regardless of whether the sponsor receives any additional federal funding.

The sponsor's acceptance of this offer and ratification and adoption of the Project Application incorporated herein shall be evidenced by execution of this instrument by the sponsor, as hereinafter provided, and this offer and acceptance shall comprise a Grant Agreement, constituting the contractual obligations and rights of the United States and the sponsor with respect to the accomplishment of the project and compliance with the Grant Assurances, terms, and conditions as provided herein. Such Grant Agreement shall become effective upon the sponsor's acceptance of this offer.

Please read the following information: By signing this document, you are agreeing that you have reviewed the following consumer disclosure information and consent to transact business using electronic communications, to receive notices and disclosures electronically, and to utilize electronic signatures in lieu of using paper documents. You are not required to receive notices and disclosures or sign documents electronically. If you prefer not to do so, you may request to receive paper copies and withdraw your consent at any time.

I declare under penalty of perjury that the foregoing is true and correct.[1]

UNITED STATES OF AMERICA
FEDERAL AVIATION ADMINISTRATION

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(Signature)

{{N_es_:signer1:fullname }}

(Typed Name)

{{N_es_:signer1:title }}

(Title of FAA Official)

[1] Knowingly and willfully providing false information to the Federal government is a violation of 18 U.S.C. § 1001 (False Statements) and could subject you to fines, imprisonment, or both.

Part II - Acceptance

The sponsor does hereby ratify and adopt all assurances, statements, representations, warranties, covenants, and agreements contained in the Project Application and incorporated materials referred to in the foregoing offer, and does hereby accept this offer and by such acceptance agrees to comply with all of the Grant Assurances, terms, and conditions in this offer and in the Project Application.

Please read the following information: By signing this document, you are agreeing that you have reviewed the following consumer disclosure information and consent to transact business using electronic communications, to receive notices and disclosures electronically, and to utilize electronic signatures in lieu of using paper documents. You are not required to receive notices and disclosures or sign documents electronically. If you prefer not to do so, you may request to receive paper copies and withdraw your consent at any time.

I declare under penalty of perjury that the foregoing is true and correct.[2]

Dated **{{DateTime_es_:signer2:calc(now()):format(date," mmmm d, yyyy")}}**

CITY OF PUEBLO, COLORADO

(Name of Sponsor)

{{Sig_es_:signer2:signature:dimension(height=12mm, width=70mm)}}

(Signature of Sponsor's Authorized Official)

By: **{{N_es_:signer2:fullname }}**

(Typed Name of Sponsor's Authorized Official)

Title: **{{*Ttl_es_:signer2:title }}**

(Title of Sponsor's Authorized Official)

[2] Knowingly and willfully providing false information to the Federal Government is a violation of 18 USC § 1001 (False Statements) and could subject you to fines, imprisonment, or both.

CERTIFICATE OF SPONSOR'S ATTORNEY

I, **{{N_es_:signer3: fullname}}**, acting as Attorney for the Sponsor do hereby certify:

That in my opinion the Sponsor is empowered to enter into the foregoing Grant Agreement under the laws of the State of __Colorado__. Further, I have examined the foregoing Grant Agreement and the actions taken by said Sponsor and Sponsor's official representative, who has been duly authorized to execute this Grant Agreement, which is in all respects due and proper and in accordance with the laws of the said State; and Title 49, United States Code (USC), Chapters 471 and 475; 49 USC §§ 40101 et seq., and 48103; Consolidated Appropriations Act, 2024 (P.L. 118-42); Consolidated Appropriations Act, 2025 (P.L. 119-4); Consolidated Appropriations Act, 2026 (P.L. 119-75); FAA Reauthorization Act of 2024 (P.L. 118-63); and the representations contained in the Project Application. In addition, for grants involving projects to be carried out on property not owned by the Sponsor, there are no legal impediments that will prevent full performance by the Sponsor. Further, it is my opinion that the said Grant Agreement constitutes a legal and binding obligation of the Sponsor in accordance with the terms thereof.

Please read the following information: By signing this document, you are agreeing that you have reviewed the following consumer disclosure information and consent to transact business using electronic communications, to receive notices and disclosures electronically, and to utilize electronic signatures in lieu of using paper documents. You are not required to receive notices and disclosures or sign documents electronically. If you prefer not to do so, you may request to receive paper copies and withdraw your consent at any time.

I declare under penalty of perjury that the foregoing is true and correct.[3]

Dated at **{{DateTime_es_:signer3:calc(now()):format(date," mmmm d, yyyy")}}**

By: {{Sig_es_:signer3:signature:dimension(height=12mm, width=70mm)}}

(Signature of Sponsor's Attorney)

[3] Knowingly and willfully providing false information to the Federal Government is a violation of 18 USC § 1001 (False Statements) and could subject you to fines, imprisonment, or both.

ASSURANCES
AIRPORT SPONSORS

A. General.

1. These assurances shall be complied with in the performance of grant agreements for airport development, airport planning, and noise compatibility program grants for airport sponsors.
2. These assurances are required to be submitted as part of the project application by sponsors requesting funds under the provisions of Title 49, USC, subtitle VII, as amended. As used herein, the term "public agency sponsor" means a public agency with control of a public-use airport; the term "private sponsor" means a private owner of a public-use airport; and the term "sponsor" includes both public agency sponsors and private sponsors.
3. Upon acceptance of this Grant Offer by the sponsor, these assurances are incorporated in and become part of this Grant Agreement.

B. Duration and Applicability.

1. Airport Development or Noise Compatibility Program Projects Undertaken by a Public Agency Sponsor.

The terms, conditions and assurances of this Grant Agreement shall remain in full force and effect throughout the useful life of the facilities developed or equipment acquired for an airport development or noise compatibility program project, or throughout the useful life of the project items installed within a facility under a noise compatibility program project, but in any event not to exceed twenty (20) years from the date of acceptance of a Grant Offer of federal funds for the project. However, there shall be no limit on the duration of the assurances regarding Exclusive Rights and Airport Revenue so long as the airport is used as an airport. There shall be no limit on the duration of the terms, conditions, and assurances with respect to real property acquired with federal funds. Furthermore, the duration of the Civil Rights assurance shall be specified in the assurances.

2. Airport Development or Noise Compatibility Projects Undertaken by a Private Sponsor.

The preceding paragraph (1) also applies to a private sponsor except that the useful life of project items installed within a facility or the useful life of the facilities developed or equipment acquired under an airport development or noise compatibility program project shall be no less than ten (10) years from the date of acceptance of federal aid for the project.

3. Airport Planning Undertaken by a Sponsor.

Unless otherwise specified in this Grant Agreement, only Assurances 1, 2, 3, 5, 6, 13, 18, 23, 25, 30, 32, 33, 34, 37, and 40 in Section C apply to planning projects. The terms, conditions, and assurances of this Grant Agreement shall remain in full force and effect during the life of the project; there shall be no limit on the duration of the assurances regarding Exclusive Rights and Airport Revenue so long as the airport is used as an airport.

C. Sponsor Certification.

The sponsor hereby assures and certifies, with respect to this grant that:

1. General Federal Requirements

It will comply with all applicable federal laws, regulations, executive orders, policies, guidelines, and requirements as they relate to the application, acceptance, and use of federal funds for this grant. Performance under this agreement shall be governed by and in compliance with the following requirements, as applicable, to the type of organization of the Sponsor and any applicable sub-recipients. The applicable provisions to this agreement include, but are not limited to, the following:

FEDERAL LEGISLATION

a. 49 USC subtitle VII, as amended.
b. Davis-Bacon Act, as amended — 40 USC §§ 3141-3144, 3146, and 3147, et seq.[1]
c. Federal Fair Labor Standards Act – 29 USC § 201, et seq.
d. Hatch Act – 5 USC § 1501, et seq.[2]
e. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 42 USC § 4601, et seq.[1, 2]
f. National Historic Preservation Act of 1966 – Section 106 – 54 USC § 306108.[1]
g. Archeological and Historic Preservation Act of 1974 – 54 USC § 312501, et seq.[1]
h. Native Americans Grave Repatriation Act – 25 USC § 3001, et seq.
i. Clean Air Act, P.L. 90-148, as amended – 42 USC § 7401, et seq.
j. Coastal Zone Management Act, P.L. 92-583, as amended – 16 USC § 1451, et seq.
k. Flood Disaster Protection Act of 1973 – Section 102(a) - 42 USC § 4012a.[1]
l. 49 USC § 303, (formerly known as Section 4(f)).
m. Rehabilitation Act of 1973 – 29 USC § 794.
n. Title VI of the Civil Rights Act of 1964 (42 USC § 2000d et seq.) (prohibits discrimination on the basis of race, color, national origin).
o. Americans with Disabilities Act of 1990, as amended, (42 USC § 12101 et seq.) (prohibits discrimination on the basis of disability).
p. Age Discrimination Act of 1975 – 42 USC § 6101, et seq.
q. American Indian Religious Freedom Act, P.L. 95-341, as amended.
r. Architectural Barriers Act of 1968, as amended – 42 USC § 4151, et seq.[1]
s. Powerplant and Industrial Fuel Use Act of 1978 – Section 403 – 42 USC § 8373.[1]
t. Contract Work Hours and Safety Standards Act – 40 USC § 3701, et seq.[1]
u. Copeland Anti-kickback Act – 18 USC § 874.[1]

v. National Environmental Policy Act of 1969 – 42 USC § 4321, et seq.[1]

w. Wild and Scenic Rivers Act, P.L. 90-542, as amended – 16 USC § 1271, et seq.

x. Single Audit Act of 1984 – 31 USC § 7501, et seq.[2]

y. Drug-Free Workplace Act of 1988 – 41 USC §§ 8101 through 8105.

z. The Federal Funding Accountability and Transparency Act of 2006, as amended (P.L. 109-282, as amended by section 6202 of P.L. 110-252).

aa. Civil Rights Restoration Act of 1987, P.L. 100-259.

bb. Infrastructure Investment and Jobs Act, P.L. 117-58, Title VIII.

cc. Build America, Buy America Act, P.L. 117-58, Title IX.

dd. Endangered Species Act – 16 USC 1531, et seq.

ee. Title IX of the Education Amendments of 1972, as amended – 20 USC 1681–1683 and 1685–1687.

ff. Drug Abuse Office and Treatment Act of 1972, as amended – 21 USC 1101, et seq.

gg. Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, P.L. 91-616, as amended – 42 USC § 4541, et seq.

hh. Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, P.L. 91-616, as amended – 42 USC § 4541, et seq.

ii. Appropriated Funds to Influence Certain Federal Contracting and Financial Transactions – 31 USC § 1352.

EXECUTIVE ORDERS

a. Executive Order 11990 – Protection of Wetlands

b. Executive Order 11988 – Floodplain Management

c. Executive Order 12372 – Intergovernmental Review of Federal Programs

d. Executive Order 12699 – Seismic Safety of Federal and Federally Assisted New Building Construction[1]

e. Executive Order 14005 – Ensuring the Future is Made in all of America by All of America's Workers

f. Executive Order 14149 – Restoring Freedom of Speech and Ending Federal Censorship

g. Executive Order 14151 – Ending Radical and Wasteful Government DEI Programs and Preferencing

h. Executive Order 14154 – Unleashing American Energy

i. Executive Order 14168 – Defending Women from Gender Ideology Extremism and Restoring Biological Truth to the Federal Government

j. Executive Order 14173 – Ending Illegal Discrimination and Restoring Merit-Based Opportunity

FEDERAL REGULATIONS

a. 2 CFR Part 180 – OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement).

b. 2 CFR Part 200 and 1201 – Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards. [3, 4, 5]

c. 2 CFR Part 1200 – Nonprocurement Suspension and Debarment.

d. 14 CFR Part 13 – Investigative and Enforcement Procedures.

e. 14 CFR Part 16 – Rules of Practice for Federally-Assisted Airport Enforcement Proceedings.

f. 14 CFR Part 150 – Airport Noise Compatibility Planning.

g. 28 CFR Part 35 – Nondiscrimination on the Basis of Disability in State and Local Government Services.

h. 28 CFR § 50.3 – U.S. Department of Justice Guidelines for the Enforcement of Title VI of the Civil Rights Act of 1964.

i. 29 CFR Part 1 – Procedures for Predetermination of Wage Rates.[1]

j. 29 CFR Part 3 – Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States.[1]

k. 29 CFR Part 5 – Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction (Also Labor Standards Provisions Applicable to Nonconstruction Contracts Subject to the Contract Work Hours and Safety Standards Act).[1]

l. 41 CFR Part 60 – Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor (Federal and Federally-assisted contracting requirements).[1]

m. 49 CFR Part 20 – New Restrictions on Lobbying.

n. 49 CFR Part 21 – Nondiscrimination in Federally-Assisted Programs of the Department of Transportation - Effectuation of Title VI of the Civil Rights Act of 1964.

o. 49 CFR Part 23 – Participation by Disadvantage Business Enterprise in Airport Concessions.

p. 49 CFR Part 24 – Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally-Assisted Programs.[1, 2]

q. 49 CFR Part 26 – Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs.

r. 49 CFR Part 27 – Nondiscrimination on the Basis of Disability in Programs or Activities Receiving Federal Financial Assistance.[1]

s. 49 CFR Part 28 – Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities Conducted by the Department of Transportation.

t. 49 CFR Part 30 – Denial of Public Works Contracts to Suppliers of Goods and Services of Countries That Deny Procurement Market Access to U.S. Contractors.

u. 49 CFR Part 32 – Governmentwide Requirements for Drug-Free Workplace (Financial Assistance).

v. 49 CFR Part 37 – Transportation Services for Individuals with Disabilities (ADA).

w. 49 CFR Part 38 – Americans with Disabilities Act (ADA) Accessibility Specifications for Transportation Vehicles.

x. 49 CFR Part 41 – Seismic Safety.

FOOTNOTES TO ASSURANCE (C)(1)

[1] These laws do not apply to airport planning sponsors.
[2] These laws do not apply to private sponsors.
[3] 2 CFR Part 200 contains requirements for state and local governments receiving federal assistance. Any requirement levied upon state and local governments by this regulation shall apply where applicable to private sponsors receiving federal assistance under Title 49, United States Code.
[4] Cost principles established in 2 CFR Part 200 subpart E must be used as guidelines for determining the eligibility of specific types of expenses.
[5] Audit requirements established in 2 CFR Part 200 subpart F are the guidelines for audits.

SPECIFIC ASSURANCES

Specific assurances required to be included in grant agreements by any of the above laws, regulations or circulars are incorporated by reference in this Grant Agreement.

2. Responsibility and Authority of the Sponsor.

a. Public Agency Sponsor:

It has legal authority to apply for this grant, and to finance and carry out the proposed project; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing body authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.

b. Private Sponsor:

It has legal authority to apply for this grant and to finance and carry out the proposed project and comply with all terms, conditions, and assurances of this Grant Agreement. It shall designate an official representative and shall in writing direct and authorize that person to file this application, including all understandings and assurances contained therein; to act in connection with this application; and to provide such additional information as may be required.

3. Sponsor Fund Availability.

It has sufficient funds available for that portion of the project costs which are not to be paid by the United States. It has sufficient funds available to assure operation and maintenance of items funded under this Grant Agreement which it will own or control.

4. Good Title.

a. It, a public agency or the Federal Government, holds good title, satisfactory to the Secretary, to the landing area of the airport or site thereof, or will give assurance satisfactory to the Secretary that good title will be acquired.

b. For noise compatibility program projects to be carried out on the property of the sponsor, it holds good title satisfactory to the Secretary to that portion of the property upon which federal funds will be expended or will give assurance to the Secretary that good title will be obtained.

5. Preserving Rights and Powers.

a. It will not take or permit any action which would operate to deprive it of any of the rights and powers necessary to perform any or all of the terms, conditions, and assurances in this Grant Agreement without the written approval of the Secretary, and will act promptly to acquire, extinguish or modify any outstanding rights or claims of right of others which would interfere with such performance by the sponsor. This shall be done in a manner acceptable to the Secretary.

b. Subject to 49 USC § 47107(a)(16) and (x), it will not sell, lease, encumber, or otherwise transfer or dispose of any part of its title or other interests in the property shown on Exhibit A to this application or, for a noise compatibility program project, that portion of the property upon which federal funds have been expended, for the duration of the terms, conditions, and assurances in this Grant Agreement without approval by the Secretary. If the transferee is found by the Secretary to be eligible under Title 49, United States Code, to assume the obligations of this Grant Agreement and to have the power, authority, and financial resources to carry out all such obligations, the sponsor shall insert in the contract or document transferring or disposing of the sponsor's interest, and make binding upon the transferee all of the terms, conditions, and assurances contained in this Grant Agreement.

c. For all noise compatibility program projects which are to be carried out by another unit of local government or are on property owned by a unit of local government other than the sponsor, it will enter into an agreement with that government. Except as otherwise specified by the Secretary, that agreement shall obligate that government to the same terms, conditions, and assurances that would be applicable to it if it applied directly to the FAA for a grant to undertake the noise compatibility program project. That agreement and changes thereto must be satisfactory to the Secretary. It will take steps to enforce this agreement against the local government if there is substantial non-compliance with the terms of the agreement.

d. For noise compatibility program projects to be carried out on privately owned property, it will enter into an agreement with the owner of that property which includes provisions specified by the Secretary. It will take steps to enforce this agreement against the property owner whenever there is substantial non-compliance with the terms of the agreement.

e. If the sponsor is a private sponsor, it will take steps satisfactory to the Secretary to ensure that the airport will continue to function as a public-use airport in accordance with these assurances for the duration of these assurances.

f. If an arrangement is made for management and operation of the airport by any agency or person other than the sponsor or an employee of the sponsor, the sponsor will reserve sufficient rights and authority to ensure that the airport will be operated and maintained in accordance with Title 49, United States Code, the regulations and the terms, conditions and assurances in this Grant Agreement and shall ensure that such arrangement also requires compliance therewith.

g. Sponsors of commercial service airports will not permit or enter into any arrangement that results in permission for the owner or tenant of a property used as a residence, or zoned for residential use, to taxi an aircraft between that property and any location on airport. Sponsors

of general aviation airports entering into any arrangement that results in permission for the owner of residential real property adjacent to or near the airport must comply with the requirements of Sec. 136 of Public Law 112-95 and the sponsor assurances.

6. Consistency with Local Plans.

The project is reasonably consistent with plans (existing at the time of submission of this application) of public agencies that are authorized by the state in which the project is located to plan for the development of the area surrounding the airport.

7. Consideration of Local Interest.

It has given fair consideration to the interest of communities in or near where the project may be located.

8. Consultation with Users.

In making a decision to undertake any airport development project under Title 49, United States Code, it has undertaken reasonable consultations with affected parties using the airport at which project is proposed.

9. Public Hearings.

In projects involving the location of an airport, an airport runway, or a major runway extension, it has afforded the opportunity for public hearings for the purpose of considering the economic, social, and environmental effects of the airport or runway location and its consistency with goals and objectives of such planning as has been carried out by the community and it shall, when requested by the Secretary, submit a copy of the transcript of such hearings to the Secretary. Further, for such projects, it has on its management board either voting representation from the communities where the project is located or has advised the communities that they have the right to petition the Secretary concerning a proposed project.

10. Metropolitan Planning Organization.

In projects involving the location of an airport, an airport runway, or a major runway extension at a medium or large hub airport, the sponsor has made available to and has provided upon request to the metropolitan planning organization in the area in which the airport is located, if any, a copy of the proposed amendment to the airport layout plan to depict the project and a copy of any airport master plan in which the project is described or depicted.

11. Pavement Preventive Maintenance-Management.

With respect to a project approved after January 1, 1995, for the replacement or reconstruction of pavement at the airport, it assures or certifies that it has implemented an effective airport pavement maintenance-management program and it assures that it will use such program for the useful life of any pavement constructed, reconstructed or repaired with federal financial assistance at the airport. It will provide such reports on pavement condition and pavement management programs as the Secretary determines may be useful.

12. Terminal Development Prerequisites.

For projects which include terminal development at a public use airport, as defined in Title 49, it has, on the date of submittal of the project grant application, all the safety equipment required for certification of such airport under 49 USC § 44706, and all the security equipment required by rule or regulation, and has provided for access to the passenger enplaning and deplaning area of such airport to passengers enplaning and deplaning from aircraft other than air carrier aircraft.

13. Accounting System, Audit, and Record Keeping Requirements.

a. It shall keep all project accounts and records which fully disclose the amount and disposition by the recipient of the proceeds of this grant, the total cost of the project in connection with which this grant is given or used, and the amount or nature of that portion of the cost of the project supplied by other sources, and such other financial records pertinent to the project. The accounts and records shall be kept in accordance with an accounting system that will facilitate an effective audit in accordance with the Single Audit Act of 1984.

b. It shall make available to the Secretary and the Comptroller General of the United States, or any of their duly authorized representatives, for the purpose of audit and examination, any books, documents, papers, and records of the recipient that are pertinent to this grant. The Secretary may require that an appropriate audit be conducted by a recipient. In any case in which an independent audit is made of the accounts of a sponsor relating to the disposition of the proceeds of a grant or relating to the project in connection with which this grant was given or used, it shall file a certified copy of such audit with the Comptroller General of the United States not later than six (6) months following the close of the fiscal year for which the audit was made.

14. Minimum Wage Rates.

It shall include, in all contracts in excess of $2,000 for work on any projects funded under this Grant Agreement which involve labor, provisions establishing minimum rates of wages, to be predetermined by the Secretary of Labor under 40 USC §§ 3141-3144, 3146, and 3147, Public Building, Property, and Works), which contractors shall pay to skilled and unskilled labor, and such minimum rates shall be stated in the invitation for bids and shall be included in proposals or bids for the work.

15. Veteran's Preference.

It shall include in all contracts for work on any project funded under this Grant Agreement which involve labor, such provisions as are necessary to insure that, in the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Vietnam era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns owned and controlled by disabled veterans as defined in 49 USC § 47112. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

16. Conformity to Plans and Specifications.

It will execute the project subject to plans, specifications, and schedules approved by the Secretary. Such plans, specifications, and schedules shall be submitted to the Secretary prior to commencement of site preparation, construction, or other performance under this Grant Agreement, and, upon approval of the Secretary, shall be incorporated into this Grant Agreement. Any modification to the approved plans, specifications, and schedules shall also be subject to approval of the Secretary, and incorporated into this Grant Agreement.

17. Construction Inspection and Approval.

It will provide and maintain competent technical supervision at the construction site throughout the project to assure that the work conforms to the plans, specifications, and schedules approved by the Secretary for the project. It shall subject the construction work on any project contained in an approved project application to inspection and approval by the Secretary and such work shall be in

accordance with regulations and procedures prescribed by the Secretary. Such regulations and procedures shall require such cost and progress reporting by the sponsor or sponsors of such project as the Secretary shall deem necessary.

18. Planning Projects.

In carrying out planning projects:

a. It will execute the project in accordance with the approved program narrative contained in the project application or with the modifications similarly approved.

b. It will furnish the Secretary with such periodic reports as required pertaining to the planning project and planning work activities.

c. It will include in all published material prepared in connection with the planning project a notice that the material was prepared under a grant provided by the United States.

d. It will make such material available for examination by the public, and agrees that no material prepared with funds under this project shall be subject to copyright in the United States or any other country.

e. It will give the Secretary unrestricted authority to publish, disclose, distribute, and otherwise use any of the material prepared in connection with this grant.

f. It will grant the Secretary the right to disapprove the sponsor's employment of specific consultants and their subcontractors to do all or any part of this project as well as the right to disapprove the proposed scope and cost of professional services.

g. It will grant the Secretary the right to disapprove the use of the sponsor's employees to do all or any part of the project.

h. It understands and agrees that the Secretary's approval of this project grant or the Secretary's approval of any planning material developed as part of this grant does not constitute or imply any assurance or commitment on the part of the Secretary to approve any pending or future application for a federal airport grant.

19. Operation and Maintenance.

a. The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state, and local agencies for maintenance and operation. It will not cause or permit any activity or action thereon which would interfere with its use for airport purposes. It will suitably operate and maintain the airport and all facilities thereon or connected therewith, with due regard to climatic and flood conditions. Any proposal to temporarily close the airport for non-aeronautical purposes must first be approved by the Secretary. In furtherance of this assurance, the sponsor will have in effect arrangements for:

   1. Operating the airport's aeronautical facilities whenever required;

   2. Promptly marking and lighting hazards resulting from airport conditions, including temporary conditions; and

   3. Promptly notifying pilots of any condition affecting aeronautical use of the airport. Nothing contained herein shall be construed to require that the airport be operated for aeronautical use during temporary periods when snow, flood, or other climatic conditions

interfere with such operation and maintenance. Further, nothing herein shall be construed as requiring the maintenance, repair, restoration, or replacement of any structure or facility which is substantially damaged or destroyed due to an act of God or other condition or circumstance beyond the control of the sponsor.

b. It will suitably operate and maintain noise compatibility program items that it owns or controls upon which federal funds have been expended.

20. Hazard Removal and Mitigation.

It will take appropriate action to ensure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.

21. Compatible Land Use.

It will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which federal funds have been expended.

22. Economic Nondiscrimination.

a. It will make the airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical activities, including commercial aeronautical activities offering services to the public at the airport.

b. In any agreement, contract, lease, or other arrangement under which a right or privilege at the airport is granted to any person, firm, or corporation to conduct or to engage in any aeronautical activity for furnishing services to the public at the airport, the sponsor will insert and enforce provisions requiring the contractor to:

1. Furnish said services on a reasonable, and not unjustly discriminatory, basis to all users thereof, and

2. Charge reasonable, and not unjustly discriminatory, prices for each unit or service, provided that the contractor may be allowed to make reasonable and nondiscriminatory discounts, rebates, or other similar types of price reductions to volume purchasers.

c. Each fixed-based operator at the airport shall be subject to the same rates, fees, rentals, and other charges as are uniformly applicable to all other fixed-based operators making the same or similar uses of such airport and utilizing the same or similar facilities.

d. Each air carrier using such airport shall have the right to service itself or to use any fixed-based operator that is authorized or permitted by the airport to serve any air carrier at such airport.

e. Each air carrier using such airport (whether as a tenant, non-tenant, or subtenant of another air carrier tenant) shall be subject to such nondiscriminatory and substantially comparable rules, regulations, conditions, rates, fees, rentals, and other charges with respect to facilities directly and substantially related to providing air transportation as are applicable to all such air carriers

which make similar use of such airport and utilize similar facilities, subject to reasonable classifications such as tenants or non-tenants and signatory carriers and non-signatory carriers. Classification or status as tenant or signatory shall not be unreasonably withheld by any airport provided an air carrier assumes obligations substantially similar to those already imposed on air carriers in such classification or status.

f. It will not exercise or grant any right or privilege which operates to prevent any person, firm, or corporation operating aircraft on the airport from performing any services on its own aircraft with its own employees (including, but not limited to maintenance, repair, and fueling) that it may choose to perform.

g. In the event the sponsor itself exercises any of the rights and privileges referred to in this assurance, the services involved will be provided on the same conditions as would apply to the furnishing of such services by commercial aeronautical service providers authorized by the sponsor under these provisions.

h. The sponsor may establish such reasonable, and not unjustly discriminatory, conditions to be met by all users of the airport as may be necessary for the safe and efficient operation of the airport.

i. The sponsor may prohibit or limit any given type, kind or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport or necessary to serve the civil aviation needs of the public.

23. Exclusive Rights.

It will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. For purposes of this paragraph, the providing of the services at an airport by a single fixed-based operator shall not be construed as an exclusive right if both of the following apply:

a. It would be unreasonably costly, burdensome, or impractical for more than one fixed-based operator to provide such services, and

b. If allowing more than one fixed-based operator to provide such services would require the reduction of space leased pursuant to an existing agreement between such single fixed-based operator and such airport. It further agrees that it will not, either directly or indirectly, grant or permit any person, firm, or corporation, the exclusive right at the airport to conduct any aeronautical activities, including, but not limited to charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations, aircraft sales and services, sale of aviation petroleum products whether or not conducted in conjunction with other aeronautical activity, repair and maintenance of aircraft, sale of aircraft parts, and any other activities which because of their direct relationship to the operation of aircraft can be regarded as an aeronautical activity, and that it will terminate any exclusive right to conduct an aeronautical activity now existing at such an airport before the grant of any assistance under Title 49, United States Code.

24. Fee and Rental Structure.

It will maintain a fee and rental structure for the facilities and services at the airport which will make the airport as self-sustaining as possible under the circumstances existing at the particular airport, taking into account such factors as the volume of traffic and economy of collection. No part of the federal share of an airport development, airport planning or noise compatibility project for

which a grant is made under Title 49, United States Code, the Airport and Airway Improvement Act of 1982, the Federal Airport Act or the Airport and Airway Development Act of 1970 shall be included in the rate basis in establishing fees, rates, and charges for users of that airport.

25. Airport Revenues.

a. All revenues generated by the airport and any local taxes on aviation fuel established after December 30, 1987, will be expended by it for the capital or operating costs of the airport; the local airport system; or other local facilities which are owned or operated by the owner or operator of the airport and which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes on or off the airport. The following exceptions apply to this paragraph:

   1. If covenants or assurances in debt obligations issued before September 3, 1982, by the owner or operator of the airport, or provisions enacted before September 3, 1982, in governing statutes controlling the owner or operator's financing, provide for the use of the revenues from any of the airport owner or operator's facilities, including the airport, to support not only the airport but also the airport owner or operator's general debt obligations or other facilities, then this limitation on the use of all revenues generated by the airport (and, in the case of a public airport, local taxes on aviation fuel) shall not apply.

   2. If the Secretary approves the sale of a privately owned airport to a public sponsor and provides funding for any portion of the public sponsor’s acquisition of land, this limitation on the use of all revenues generated by the sale shall not apply to certain proceeds from the sale. This is conditioned on repayment to the Secretary by the private owner of an amount equal to the remaining unamortized portion (amortized over a 20-year period) of any airport improvement grant made to the private owner for any purpose other than land acquisition on or after October 1, 1996, plus an amount equal to the federal share of the current fair market value of any land acquired with an airport improvement grant made to that airport on or after October 1, 1996.

   3. Certain revenue derived from or generated by mineral extraction, production, lease, or other means at a general aviation airport (as defined at 49 USC § 47102), if the FAA determines the airport sponsor meets the requirements set forth in Section 813 of Public Law 112-95.

b. As part of the annual audit required under the Single Audit Act of 1984, the sponsor will direct that the audit will review, and the resulting audit report will provide an opinion concerning, the use of airport revenue and taxes in paragraph (a), and indicating whether funds paid or transferred to the owner or operator are paid or transferred in a manner consistent with Title 49, United States Code and any other applicable provision of law, including any regulation promulgated by the Secretary or Administrator.

c. Any civil penalties or other sanctions will be imposed for violation of this assurance in accordance with the provisions of 49 USC § 47107.

26. Reports and Inspections.

It will:

a. submit to the Secretary such annual or special financial and operations reports as the Secretary may reasonably request and make such reports available to the public; make available to the

public at reasonable times and places a report of the airport budget in a format prescribed by the Secretary;

b. for airport development projects, make the airport and all airport records and documents affecting the airport, including deeds, leases, operation and use agreements, regulations and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request;

c. for noise compatibility program projects, make records and documents relating to the project and continued compliance with the terms, conditions, and assurances of this Grant Agreement including deeds, leases, agreements, regulations, and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request; and

d. in a format and time prescribed by the Secretary, provide to the Secretary and make available to the public following each of its fiscal years, an annual report listing in detail:

   1. all amounts paid by the airport to any other unit of government and the purposes for which each such payment was made; and

   2. all services and property provided by the airport to other units of government and the amount of compensation received for provision of each such service and property.

27. Use by Government Aircraft.

It will make available all of the facilities of the airport developed with federal financial assistance and all those usable for landing and takeoff of aircraft to the United States for use by Government aircraft in common with other aircraft at all times without charge, except, if the use by Government aircraft is substantial, charge may be made for a reasonable share, proportional to such use, for the cost of operating and maintaining the facilities used. Unless otherwise determined by the Secretary, or otherwise agreed to by the sponsor and the using agency, substantial use of an airport by Government aircraft will be considered to exist when operations of such aircraft are in excess of those which, in the opinion of the Secretary, would unduly interfere with use of the landing areas by other authorized aircraft, or during any calendar month that:

a. Five (5) or more Government aircraft are regularly based at the airport or on land adjacent thereto; or

b. The total number of movements (counting each landing as a movement) of Government aircraft is 300 or more, or the gross accumulative weight of Government aircraft using the airport (the total movement of Government aircraft multiplied by gross weights of such aircraft) is in excess of five million pounds.

28. Land for Federal Facilities.

It will furnish without cost to the Federal Government for use in connection with any air traffic control or air navigation activities, or weather-reporting and communication activities related to air traffic control, any areas of land or water, or estate therein as the Secretary considers necessary or desirable for construction, operation, and maintenance at federal expense of space or facilities for such purposes. Such areas or any portion thereof will be made available as provided herein within four months after receipt of a written request from the Secretary.

29. Airport Layout Plan.

a. The airport owner or operator will maintain a current airport layout plan of the airport showing:

1. boundaries of the airport and all proposed additions thereto, together with the boundaries of all offsite areas owned or controlled by the sponsor for airport purposes and proposed additions thereto;

2. the location and nature of all existing and proposed airport facilities and structures (such as runways, taxiways, aprons, terminal buildings, hangars and roads), including all proposed extensions and reductions of existing airport facilities;

3. the location of all existing and proposed non-aviation areas and of all existing improvements thereon; and

4. all proposed and existing access points used to taxi aircraft across the airport's property boundary.

b. Subject to subsection 49 USC § 47107(x), the Secretary will review and approve or disapprove the plan and any revision or modification of the plan before the plan, revision, or modification takes effect.

c. The owner or operator will not make or allow any alteration in the airport or any of its facilities unless the alteration—

1. is outside the scope of the Secretary's review and approval authority as set forth in subsection (x); or

2. complies with the portions of the plan approved by the Secretary.

d. When the airport owner or operator makes a change or alteration in the airport or the facilities which the Secretary determines adversely affects the safety, utility, or efficiency of any federally owned, leased, or funded property on or off the airport and which is not in conformity with the airport layout plan as approved by the Secretary, the owner or operator will, if requested, by the Secretary:

1. eliminate such adverse effect in a manner approved by the Secretary; or

2. bear all costs of relocating such property or its replacement to a site acceptable to the Secretary and of restoring the property or its replacement to the level of safety, utility, efficiency, and cost of operation that existed before the alteration was made, except in the case of a relocation or replacement of an existing airport facility due to a change in the Secretary's design standards beyond the control of the airport sponsor.

30. Civil Rights.

It will promptly take any measures necessary to ensure that no person in the United States shall, on the grounds of race, color, and national origin (including limited English proficiency) in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (42 USC §§ 2000d to 2000d-4); creed and sex per 49 USC § 47123 and related requirements; age per the Age Discrimination Act of 1975 and related requirements; or disability per the Americans with Disabilities Act of 1990 and related requirements, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination in any program and activity conducted with, or benefiting from, funds received from this grant.

a. Using the definitions of activity, facility, and program as found and defined in 49 CFR §§ 21.23(b) and 21.23(e), the sponsor will facilitate all programs, operate all facilities, or conduct all programs in compliance with all non-discrimination requirements imposed by or pursuant to these assurances.

b. Applicability

   1. Programs and Activities. If the sponsor has received a grant (or other federal assistance) for any of the sponsor's program or activities, these requirements extend to all of the sponsor's programs and activities.

   2. Facilities. Where it receives a grant or other federal financial assistance to construct, expand, renovate, remodel, alter, or acquire a facility, or part of a facility, the assurance extends to the entire facility and facilities operated in connection therewith.

   3. Real Property. Where the sponsor receives a grant or other federal financial assistance in the form of, or for the acquisition of real property or an interest in real property, the assurance will extend to rights to space on, over, or under such property.

c. Duration.

   The sponsor agrees that it is obligated to this assurance for the period during which federal financial assistance is extended to the program, except where the federal financial assistance is to provide, or is in the form of, personal property, or real property, or interest therein, or structures or improvements thereon, in which case the assurance obligates the sponsor, or any transferee for the longer of the following periods:

   1. So long as the airport is used as an airport, or for another purpose involving the provision of similar services or benefits; or

   2. So long as the sponsor retains ownership or possession of the property.

d. Required Solicitation Language. It will include the following notification in all solicitations for bids, Requests For Proposals for work, or material under this Grant Agreement and in all proposals for agreements, including airport concessions, regardless of funding source:

   "The (**City of Pueblo, Colorado**), in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (42 USC §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders or offerors that it will affirmatively ensure that for any contract entered into pursuant to this advertisement, all businesses will be afforded full and fair opportunity to submit bids in response to this invitation and no businesses will be discriminated against on the grounds of race, color, national origin (including limited English proficiency), creed, sex , age, or disability in consideration for an award."

e. Required Contract Provisions.

   1. It will insert the non-discrimination contract clauses requiring compliance with the acts and regulations relative to non-discrimination in federally-assisted programs of the Department of Transportation (DOT), and incorporating the acts and regulations into the contracts by reference in every contract or agreement subject to the non-discrimination in federally-assisted programs of the DOT acts and regulations.

   2. It will include a list of the pertinent non-discrimination authorities in every contract that is subject to the non-discrimination acts and regulations.

3. It will insert non-discrimination contract clauses as a covenant running with the land, in any deed from the United States effecting or recording a transfer of real property, structures, use, or improvements thereon or interest therein to a sponsor.

4. It will insert non-discrimination contract clauses prohibiting discrimination on the basis of race, color, national origin (including limited English proficiency), creed, sex, age, or disability as a covenant running with the land, in any future deeds, leases, license, permits, or similar instruments entered into by the sponsor with other parties:

   a. For the subsequent transfer of real property acquired or improved under the applicable activity, project, or program; and

   b. For the construction or use of, or access to, space on, over, or under real property acquired or improved under the applicable activity, project, or program.

f. It will provide for such methods of administration for the program as are found by the Secretary to give reasonable guarantee that it, other recipients, sub-recipients, sub-grantees, contractors, subcontractors, consultants, transferees, successors in interest, and other participants of federal financial assistance under such program will comply with all requirements imposed or pursuant to the acts, the regulations, and this assurance.

g. It agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the acts, the regulations, and this assurance.

31. Disposal of Land.

a. For land purchased under a grant for airport noise compatibility purposes, including land serving as a noise buffer, it will dispose of the land, when the land is no longer needed for such purposes, at fair market value, at the earliest practicable time. That portion of the proceeds of such disposition which is proportionate to the United States' share of acquisition of such land will be, at the discretion of the Secretary, (1) reinvested in another project at the airport, or (2) transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order:

   1. Reinvestment in an approved noise compatibility project;

   2. Reinvestment in an approved project that is eligible for grant funding under 49 USC § 47117(e);

   3. Reinvestment in an approved airport development project that is eligible for grant funding under 49 USC §§ 47114, 47115, or 47117;

   4. Transfer to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport; or

   5. Payment to the Secretary for deposit in the Airport and Airway Trust Fund.

   If land acquired under a grant for noise compatibility purposes is leased at fair market value and consistent with noise buffering purposes, the lease will not be considered a disposal of the land. Revenues derived from such a lease may be used for an approved airport development project that would otherwise be eligible for grant funding or any permitted use of airport revenue.

b. For land purchased under a grant for airport development purposes (other than noise compatibility), it will, when the land is no longer needed for airport purposes, dispose of such land at fair market value or make available to the Secretary an amount equal to the United

States' proportionate share of the fair market value of the land. That portion of the proceeds of such disposition which is proportionate to the United States' share of the cost of acquisition of such land will, upon application to the Secretary, be reinvested or transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order:

1. Reinvestment in an approved noise compatibility project;
2. Reinvestment in an approved project that is eligible for grant funding under 49 USC § 47117(e);
3. Reinvestment in an approved airport development project that is eligible for grant funding under 49 USC §§ 47114, 47115, or 47117;
4. Transfer to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport; or
5. Payment to the Secretary for deposit in the Airport and Airway Trust Fund.

c. Land shall be considered to be needed for airport purposes under this assurance if (1) it may be needed for aeronautical purposes (including runway protection zones) or serve as noise buffer land, and (2) the revenue from interim uses of such land contributes to the financial self-sufficiency of the airport. Further, land purchased with a grant received by an airport operator or owner before December 31, 1987, will be considered to be needed for airport purposes if the Secretary or federal agency making such grant before December 31, 1987, was notified by the operator or owner of the uses of such land, did not object to such use, and the land continues to be used for that purpose, such use having commenced no later than December 15, 1989.

d. Disposition of such land under (a), (b), or (c) will be subject to the retention or reservation of any interest or right therein necessary to ensure that such land will only be used for purposes which are compatible with noise levels associated with operation of the airport.

32. Engineering and Design Services.

If any phase of such project has received federal funds under Chapter 471 subchapter 1 of Title 49 USC, it will award each contract, or sub-contract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering, surveying, mapping or related services in the same manner as a contract for architectural and engineering services is negotiated under Chapter 11 of Title 40 U S.C., or an equivalent qualifications-based requirement prescribed for or by the sponsor of the airport.

33. Foreign Market Restrictions.

It will not allow funds provided under this grant to be used to fund any project which uses any product or service of a foreign country during the period in which such foreign country is listed by the United States Trade Representative as denying fair and equitable market opportunities for products and suppliers of the United States in procurement and construction.

34. Policies, Standards, and Specifications.

It will carry out any project funded under an Airport Improvement Program Grant in accordance with policies, standards, and specifications approved by the Secretary including, but not limited to, current FAA Advisory Circulars (https://www.faa.gov/airports/aip/aip_pfc_checklist) for AIP projects as of January 16, 2026.

35. Relocation and Real Property Acquisition.

a. It will be guided in acquiring real property, to the greatest extent practicable under state law, by the land acquisition policies in Subpart B of 49 CFR Part 24 and will pay or reimburse property owners for necessary expenses as specified in Subpart B.

b. It will provide a relocation assistance program offering the services described in Subpart C of 49 CFR Part 24 and fair and reasonable relocation payments and assistance to displaced persons as required in Subpart D and E of 49 CFR Part 24.

c. It will make available within a reasonable period of time prior to displacement, comparable replacement dwellings to displaced persons in accordance with Subpart E of 49 CFR Part 24.

36. Access By Intercity Buses.

The airport owner or operator will permit, to the maximum extent practicable, intercity buses or other modes of transportation to have access to the airport; however, it has no obligation to fund special facilities for intercity buses or for other modes of transportation.

37. Disadvantaged Business Enterprises (DBE)/Airport Concessions Disadvantage Business Enterprise (ACDBE) Program.

The sponsor shall not discriminate on the basis of race, color, national origin, or sex, in the award and performance of any DOT-assisted contract covered by 49 CFR Part 26, or in the award and performance of any concession activity contract covered by 49 CFR Part 23. In addition, the sponsor shall not discriminate on the basis of race, color, national origin or sex in the administration of its Disadvantaged Business Enterprise (DBE) and Airport Concessions Disadvantaged Business Enterprise (ACDBE) programs or the requirements of 49 CFR Parts 23 and 26. The sponsor shall take all necessary and reasonable steps under 49 CFR Parts 23 and 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts, and/or concession contracts. The sponsor's DBE and ACDBE programs, as required by 49 CFR Parts 26 and 23, and as approved by DOT, are incorporated by reference in this agreement. Implementation of these programs is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the sponsor of its failure to carry out its approved program, the Department may impose sanctions as provided for under Parts 26 and 23 and may, in appropriate cases, refer the matter for enforcement under 18 USC § 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 USC §§ 3801-3809, 3812).

38. Hangar Construction.

If the airport owner or operator and a person who owns an aircraft agree that a hangar is to be constructed at the airport for the aircraft at the aircraft owner's expense, the airport owner or operator will grant to the aircraft owner for the hangar a long term lease that is subject to such terms and conditions on the hangar as the airport owner or operator may impose.

39. Competitive Access.

a. If the airport owner or operator of a medium or large hub airport (as defined in 49 USC § 47102) has been unable to accommodate one or more requests by an air carrier for access to gates or other facilities at that airport in order to allow the air carrier to provide service to the airport or to expand service at the airport, the airport owner or operator shall transmit a report to the Secretary that:

1. Describes the requests;

2. Provides an explanation as to why the requests could not be accommodated; and
3. Provides a time frame within which, if any, the airport will be able to accommodate the requests.

b. Such report shall be due on either February 1 or August 1 of each year if the airport has been unable to accommodate the request(s) in the six month period prior to the applicable due date.

40. Access to Leaded Aviation Gasoline

a. If 100-octane low lead aviation gasoline (100LL) was made available at an airport, at any time during calendar year 2022, an airport owner or operator may not restrict or prohibit the sale of, or self-fueling with, 100-octane low lead aviation gasoline.

b. This requirement remains until the earlier of December 31, 2030, or the date on which the airport or any retail fuel seller at the airport makes available an unleaded aviation gasoline that has been authorized for use by the FAA as a replacement for 100-octane low lead aviation gasoline for use in nearly all piston-engine aircraft and engine models; and meets either an industry consensus standard or other standard that facilitates the safe use, production, and distribution of such unleaded aviation gasoline, as determined appropriate by the FAA.

c. An airport owner or operator understands and agrees, that any violation of this grant assurance is subject to civil penalties as provided for in 49 USC § 46301(a)(8).

U.S. Department of Transportation Federal Aviation Administration

Airports Division Northwest Mountain Region Colorado, Utah, Wyoming

Denver Airports District Office: 26805 E 68th Ave, Ste 224 Denver, CO 80249-6339

{{DateTime_es_:signer1:calc(now()):format(date," mmmm d, yyyy")}}

The Honorable Heather Graham
Mayor, City of Pueblo
1 City Hall Place
Pueblo, Colorado 81003

Dear Mayor Graham:

The Grant Offer for Infrastructure Investment and Jobs Act (IIJA) Project No. 3-08-0046-054-2026 at Pueblo Memorial Airport is attached for execution. This letter outlines the steps you must take to properly enter into this agreement and provides other useful information. Please read the conditions, special conditions, and assurances that comprise the Grant Offer carefully.

You may not make any modification to the text, terms or conditions of the Grant Offer.

***Steps You Must Take to Enter Into Agreement*.**

To properly enter into this agreement, you must do the following:

1. The governing body must give authority to execute the grant to the individual(s) signing the grant, i.e., the person signing the document must be the sponsor's authorized representative(s) (hereinafter "authorized representative").
2. The authorized representative must execute the grant by adding their electronic signature to the appropriate certificate at the end of the agreement.
3. Once the authorized representative has electronically signed the grant, the sponsor's attorney(s) will automatically receive an email notification.
4. On the **same day or after** the authorized representative has signed the grant, the sponsor's attorney(s) will add their electronic signature to the appropriate certificate at the end of the agreement.
5. If there are co-sponsors, the authorized representative(s) and sponsor's attorney(s) must follow the above procedures to fully execute the grant and finalize the process. Signatures must be obtained and finalized no later than **July 24, 2026**.
6. The fully executed grant will then be automatically sent to all parties as an email attachment.

Payment. Subject to the requirements in 2 CFR § 200.305 (federal payment), each payment request for reimbursement under this grant must be made electronically via the Delphi eInvoicing System. Please see the attached Grant Agreement for more information regarding the use of this system.

Project Timing. The terms and conditions of this agreement require you to complete the project without undue delay and no later than the Period of Performance end date four (4) years from the grant

execution date). We will be monitoring your progress to ensure proper stewardship of these federal funds. We expect you to submit payment requests for reimbursement of allowable incurred project expenses consistent with project progress. Your grant may be placed in "inactive" status if you do not make draws on a regular basis, which will affect your ability to receive future Grant Offers. Costs incurred after the Period of Performance ends are generally not allowable and will be rejected unless authorized by the FAA in advance.

Reporting. Until the grant is completed and closed, you are responsible for submitting formal reports as follows:

- For all grants, you must submit by December 31st of each year this grant is open:
  1. A signed/dated SF-270 (Request for Advance or Reimbursement for non-construction projects) or SF-271 or equivalent (Outlay Report and Request for Reimbursement for Construction Programs), and
  2. An SF-425 (Federal Financial Report).
- For non-construction projects, you must submit FAA Form 5100-140, Performance Report within 30 days of the end of the federal fiscal year.
- For construction projects, you must submit FAA Form 5370-1, Construction Progress and Inspection Report, within 30 days of the end of each federal fiscal quarter.

Audit Requirements. As a condition of receiving federal assistance under this award, you must comply with audit requirements as established under 2 CFR Part 200. Subpart F requires non-federal entities that expend $1,000,000 or more in federal awards to conduct a single or program specific audit for that year. Note that this includes federal expenditures made under other federal-assistance programs. Please take appropriate and necessary action to ensure your organization will comply with applicable audit requirements and standards.

Closeout. Once the project(s) is completed and all costs are determined, we ask that you work with your FAA contact indicated below to close the project without delay and submit the necessary final closeout documentation as required by your Region/Airports District Office.

FAA Contact Information. Paulette Lugo, (303) 342-1256, paulette.lugo@faa.gov is the assigned program manager for this grant and is readily available to assist you and your designated representative with the requirements stated herein.

We sincerely value your cooperation in these efforts and look forward to working with you to complete this important project.

Sincerely,

{{Sig_es_:signer1: signature}}

Jesse A. Lyman
Manager, Denver Airports District Office

U.S. Department of Transportation Federal Aviation Administration

FEDERAL AVIATION ADMINISTRATION

FY 2026

AIRPORT INFRASTRUCTURE GRANT (AIG) GRANT AGREEMENT

Part I - Offer

Federal Award Offer Date	**{{DateTime_es_:signer1:calc(now()):format(date," mmmm d, yyyy")}}**
Airport/Planning Area	Pueblo Memorial Airport
Airport Grant Number	3-08-0046-054-2026 [Contract No. DOT-FA26NM-1076]
Unique Entity Identifier	NJK3BNUDRHJ7

TO: City of Pueblo, Colorado

(herein called the "Sponsor") (For Co-Sponsors, list all Co-Sponsor names. The word "Sponsor" in this Grant Agreement also applies to a Co-Sponsor.)

FROM: **The United States of America** (acting through the Federal Aviation Administration, herein called the "FAA")

WHEREAS, the sponsor has submitted to the FAA a Project Application dated January 16, 2026, for a grant of federal funds for a project at or associated with the Pueblo Memorial Airport, which is included as part of this Grant Agreement; and

WHEREAS, the FAA has approved a project for the Pueblo Memorial Airport (herein called the "Project") consisting of the following:

Reseal Taxiway A, C, and D (About 71% of Total Project)

which is more fully described in the Project Application.

NOW THEREFORE, Pursuant to and for the purpose of carrying out Title 49, United States Code (USC), Chapters 471 and 475; 49 USC §§ 40101 et seq. and 48103; Consolidated Appropriations Act, 2024 (Public Law Number (P.L.) 118-42); Consolidated Appropriations Act, 2025 (P.L. 119-4); Consolidated Appropriations Act, 2026 (P.L. 119-75); FAA Reauthorization Act of 2024 (P.L. 118-63); Infrastructure

Investment and Jobs Act of 2021 (IIJA) (P.L. 117-58) (as applicable); and the representations contained in the Project Application; and in consideration of: (a) the sponsor's adoption and ratification of the most recently published Grant Assurances; (b) the sponsor's acceptance of this offer; and (c) the benefits to accrue to the United States and the public from the accomplishment of the project, and compliance with the Grant Assurance and conditions as herein provided;

THE FEDERAL AVIATION ADMINISTRATION, FOR AND ON BEHALF OF THE UNITED STATES, HEREBY OFFERS AND AGREES to pay (95) % of the allowable costs incurred accomplishing the Project as the United States' share of the Project.

Assistance Listings Number(s): 20.117**.**

This Offer is made on and SUBJECT TO THE FOLLOWING TERMS AND CONDITIONS:

CONDITIONS

1. **Maximum Obligation.** The maximum obligation of the United States payable under this Offer is $285,000.

   The following amounts represent a breakdown of the maximum obligation for the purpose of establishing allowable amounts for any future grant amendment, which may increase the foregoing maximum obligation of the United States under the provisions of 49 USC § 47108(b):
   $0 for planning
   $285,000 for airport development or noise program implementation; and,
   $0 for land acquisition.

2. **Grant Performance.** This agreement is subject to the following federal award requirements:

   a. Period of Performance:

      i. Start Date: The date the recipient formally accepts this agreement and the date signed by the last signatory to the agreement.

      ii. End Date: Four (4) years to the calendar day from the date of acceptance.

      iii. Extension of the Period of Performance (PoP): The recipient may request a one-time extension of up to one year after the PoP end date by submitting a request to the FAA. The request must include, at a minimum, supporting justification for the request and the amount of additional time requested. The request must be submitted at least 10 calendar days before the PoP end date. This one-time extension may not be exercised for the sole purpose of using unobligated balances.

      The PoP end date, or any extension as approved by FAA, shall not affect, relieve, or reduce recipient obligations and assurances that extend beyond the closeout of this agreement.

   b. Budget Period:

      i. For a single year grant offer, the budget period follows the same start and end date as the PoP provided in paragraph 2(a), and any extension of the PoP end date.

      ii. For a multi-year grant offer, per the authority provided in 49 USC § 47108 and § 47114, the budget period is from the initial PoP start date through the end of the final fiscal year identified on a multi-year grant offer (See Multi-Year Grant Special Condition, if applicable).

   c. Appropriation Period of Availability and Expenditure:

i. The FAA must obligate appropriated funds within the period of availability identified in the appropriation.

ii. In accordance with 31 USC § 1552, by September 30th of the fifth fiscal year after the period of availability, FAA must liquidate and close expired appropriations, and any remaining balance (whether obligated or unobligated) must be canceled and thereafter shall not be available for obligation or expenditure for any purpose.

iii. IIJA and Supplemental AIP funding are subject to this condition.

d. Close Out:

Recipients shall begin the closeout process upon physical completion of the project(s) identified in this agreement. Closeout shall proceed expeditiously and without delay, even if the PoP end date has not been reached. In accordance with 2 Code of Federal Regulations (CFR) 200, unless the FAA authorizes a written extension, the recipient must submit all grant closeout documentation and liquidate (pay-off) all obligations incurred under this award no later than 120 calendar days after the PoP end date. If the recipient does not submit all required closeout documentation within this period, the FAA will proceed to close out the grant within one year of the PoP end date with the information available at the end of 120 days.

e. Termination:

The FAA may terminate this agreement and all of its obligations under this agreement if any of the following occur:

i. The recipient fails to comply with the terms and conditions of this agreement;

ii. The recipient fails to obtain or provide any recipient grant contribution as required by the agreement;

iii. There is a material failure to comply with the Project Schedule even if it is beyond the reasonable control of the recipient;

iv. Any project changes that the FAA determines are inconsistent with the FAA's basis for selecting the project to receive a grant;

v. Continued grant payment inactivity, generally defined as no drawdowns over a 12-month period;

vi. The recipient requests that the FAA terminate the agreement under this section; or

vii. The FAA determines that termination of this agreement is in the public interest.

In terminating this agreement under this section, the FAA may elect to consider only the interests of the FAA.

3. Ineligible or Unallowable Costs. In accordance with 49 USC § 47110, the sponsor is prohibited from including any costs in the grant funded portions of the project that the FAA has determined to be ineligible or unallowable, including costs incurred to carry out airport development implementing policies and initiatives repealed by Executive Order 14148, provided such costs are not otherwise permitted by statute.

4. Indirect Costs - Sponsor. The sponsor may charge indirect costs under this award by applying the indirect cost rate identified in the project application, as accepted by the FAA, to allowable costs for sponsor direct salaries and wages.

5. **Determining the Final Federal Share of Costs.** The United States' share of allowable project costs will be made in accordance with 49 USC § 47109, the regulations, policies, and procedures of the Secretary of Transportation ("Secretary"), and any superseding legislation. Final determination of the United States' share will be based upon the final audit of the total amount of allowable project costs, and settlement will be made for any upward or downward adjustments to the federal share of costs.

6. **Completing the Project Without Delay and in Conformance with Requirements.** The sponsor must carry out and complete the project without undue delay, and in accordance with this agreement, 49 USC Chapters 471 and 475, IIJA (P.L. 117-58) (as appropriate), and the regulations, policies, and procedures of the Secretary. Per 2 CFR § 200.308, the sponsor agrees to report and request prior FAA approval for any disengagement from performing the project that exceeds three months, or a 25 percent reduction in time devoted to the project. The report must include a reason for the project stoppage. The sponsor also agrees to comply with the grant assurances, which are part of this agreement.

7. **Amendments or Withdrawals before Grant Acceptance.** The FAA reserves the right to amend or withdraw this offer at any time prior to its acceptance by the sponsor.

8. **Offer Expiration Date.** This offer will expire and the United States will not be obligated to pay any part of the costs of the project(s) unless this offer has been accepted by the sponsor on or before July 24, 2026, or such subsequent date as may be prescribed in writing by the FAA.

9. **Improper Use of Federal Funds and Mandatory Disclosure.**

   a. The sponsor must take all steps, including litigation, if necessary, to recover federal funds spent fraudulently, wastefully, or in violation of federal antitrust statutes, or misused in any other manner for any project upon which federal funds have been expended. For the purposes of this grant agreement, the term "federal funds" means funds however used or dispersed by the sponsor, that were originally paid pursuant to this or any other federal grant agreement. The sponsor must obtain the approval of the Secretary as to any determination of the amount of the federal share of such funds. The sponsor must return the recovered federal share, including funds recovered by settlement, order, or judgment, to the Secretary. Upon request, the sponsor must furnish to the Secretary all documents and records pertaining to the determination of the amount of the federal share, or to any settlement, litigation, negotiation, or other efforts taken to recover such funds. All settlements or other final positions of the sponsor, in court or otherwise, involving the recovery of such federal share require advance approval by the Secretary.

   b. The sponsor, a recipient, and a subrecipient under this federal grant must promptly comply with the mandatory disclosure requirements as established under 2 CFR § 200.113, including reporting requirements related to recipient integrity and performance in accordance with Appendix XII to 2 CFR Part 200.

10. **United States Not Liable for Damage or Injury.** The United States is not responsible or liable for damage to property or injury to persons which may arise from, or be incident to, compliance with this agreement.

11. **System for Award Management (SAM) Registration and Unique Entity Identifier (UEI).**

   a. Requirement for System for Award Management (SAM): Unless the sponsor is exempted from this requirement under 2 CFR § 25.110, the sponsor must maintain the currency of its information in the SAM until the sponsor submits the final financial report required under this

grant, or receives the final payment, whichever is later. This requires that the sponsor review and update the information at least annually after the initial registration and more frequently if required by changes in information or another award term. Additional information about registration procedures may be found at the SAM website (currently at http://www.sam.gov).

b. Unique entity identifier (UEI) means a 12-character alpha-numeric value used to identify a specific commercial, nonprofit, or governmental entity. A UEI may be obtained from SAM.gov at https://sam.gov/content/entity-registration.

12. **Electronic Grant Payment(s).** Unless otherwise directed by the FAA, the sponsor must make each payment request under this agreement electronically via the Delphi eInvoicing System for Department of Transportation (DOT) Financial Assistance Awardees.

13. **Informal Letter Amendment of Projects.** If, during the life of the project, the FAA determines that the maximum grant obligation of the United States exceeds the expected needs of the sponsor by $25,000 or five percent, whichever is greater, the FAA can issue a letter amendment to the sponsor unilaterally reducing the maximum obligation.

    The FAA can also issue a letter to the sponsor increasing the maximum obligation if there is an overrun in the total actual eligible and allowable project costs to cover the amount of the overrun, provided it will not exceed the statutory limitations for grant amendments. The FAA's authority to increase the maximum obligation does not apply to the "planning" component of Condition No. 1, Maximum Obligation.

    The FAA can also issue an informal letter amendment that modifies the grant description to correct administrative errors or to delete work items if the FAA finds it advantageous, and in the best interests of the United States.

    An informal letter amendment has the same force and effect as a formal grant amendment.

14. **Environmental Standards.** The sponsor is required to comply with all applicable environmental standards, as further defined in the Grant Assurances, for all projects in this grant. If the sponsor fails to comply with this requirement, the FAA may suspend, cancel, or terminate this Grant Agreement.

15. **Financial Reporting and Payment Requirements.** The sponsor will comply with all federal financial reporting requirements and payment requirements, including submittal of timely and accurate reports.

16. **Buy American.** Unless otherwise approved in advance by the FAA, in accordance with 49 USC § 50101, the sponsor will not acquire or permit any contractor or subcontractor to acquire any steel or manufactured goods produced outside the United States to be used for any project for which funds are provided under this grant. The sponsor will include a provision implementing Buy American in every contract and subcontract awarded under this grant.

17. **Build America, Buy America.** The sponsor must comply with the requirements under the Build America, Buy America Act (P.L. 117-58).

18. **Maximum Obligation Increase.** In accordance with 49 USC § 47108(b)(2), as amended, the maximum obligation of the United States, as stated in Condition No. 1, Maximum Obligation, of this grant:

    a. May not be increased for a planning project;

    b. May be increased by not more than 15 percent for development projects, if funds are available;

c. May be increased by not more than the greater of the following for a land project, if funds are available:

i. 15 percent; or

ii. 25 percent of the total increase in allowable project costs attributable to acquiring an interest in the land.

If the sponsor requests an increase, any eligible increase in funding will be subject to the United States Government share as provided in 49 USC § 47109, or IIJA (P.L. 17-58), or other superseding legislation if applicable, for the fiscal year appropriation with which the increase is funded. The FAA is not responsible for the same federal share provided herein for any amount increased over the initial grant amount. The FAA may adjust the federal share as applicable through an informal letter of amendment.

19. Audits for Sponsors.

PUBLIC SPONSORS. The sponsor must provide for a Single Audit or program-specific audit in accordance with 2 CFR Part 200. The sponsor must submit the audit reporting package to the Federal Audit Clearinghouse on the Federal Audit Clearinghouse's Internet Data Entry System at http://harvester.census.gov/facweb/. Upon request of the FAA, the sponsor shall provide one copy of the completed audit to the FAA. Sponsors that expend less than $1,000,000 in federal awards and are exempt from federal audit requirements must make records available for review or audit by the appropriate federal agency officials, state, and Government Accountability Office. The FAA and other appropriate federal agencies may request additional information to meet all federal audit requirements.

20. Suspension or Debarment. When entering into a "covered transaction" as defined by 2 CFR § 180.200, the sponsor must:

a. Verify the non-federal entity is eligible to participate in this federal program by:

i. Checking the System for Award Management (SAM.gov) exclusions to determine if the non-federal entity is excluded or disqualified; or

ii. Collecting a certification statement from the non-federal entity attesting they are not excluded or disqualified from participating; or

iii. Adding a clause or condition to covered transactions attesting the individual or firm are not excluded or disqualified from participating.

b. Require prime contractors to comply with 2 CFR § 180.330 when entering into lower-tier transactions with their contractors and sub-contractors.

c. Immediately disclose in writing to the FAA whenever (1) the sponsor learns they have entered into a covered transaction with an ineligible entity or (2) the public sponsor suspends or debars a contractor, person, or entity.

21. Ban on Texting While Driving.

a. In accordance with Executive Order 13513, Federal Leadership on Reducing Text Messaging While Driving, October 1, 2009, and DOT Order 3902.10, Text Messaging While Driving, December 30, 2009, the sponsor is encouraged to:

i. Adopt and enforce workplace safety policies to decrease crashes caused by distracted drivers, including policies to ban text messaging while driving when performing any work

for, or on behalf of, the Federal Government, including work relating to a grant or subgrant.

ii. Conduct workplace safety initiatives in a manner commensurate with the size of the business, such as:

a) Establishment of new rules and programs or re-evaluation of existing programs to prohibit text messaging while driving; and

b) Education, awareness, and other outreach to employees about the safety risks associated with texting while driving.

f. The sponsor must insert the substance of this clause on banning texting while driving in all subgrants, contracts, and subcontracts funded with this grant.

22. <u>Trafficking in Persons</u>.

a. *Posting of contact information.*

i. The sponsor must post the contact information of the national human trafficking hotline (including options to reach out to the hotline such as through phone, text, or TTY) in all public airport restrooms.

b. *Provisions applicable to a sponsor that is a private entity.*

i. Under this grant, the sponsor, its employees, subrecipients under this grant, and subrecipient's employees must not engage in:

a) Severe forms of trafficking in persons;

b) The procurement of a commercial sex act during the period of time that the grant or cooperative agreement is in effect;

c) The use of forced labor in the performance of this grant; or any subaward; or

d) Acts that directly support or advance trafficking in persons, including the following acts:

1. Destroying, concealing, removing, confiscating, or otherwise denying an employee access to that employee's identity or immigration documents;

2. Failing to provide return transportation of pay for return transportation costs to an employee from a country outside the United States to the country from which the employee was recruited upon the end of employment if requested by the employee, unless:

a. Exempted from the requirement to provide or pay for such return transportation by the federal department or agency providing or entering into the grant; or

b. The employee is a victim of human trafficking seeking victim services or legal redress in the country of employment or witness in a human trafficking enforcement action;

3. Soliciting a person for the purpose of employment, or offering employment, by means of materially false or fraudulent pretenses, representations, or promises regarding that employment;

4. Charging recruited employees a placement or recruitment fee; or
5. Providing or arranging housing that fails to meet the host country's housing and safety standards.

ii. The FAA may unilaterally terminate this grant or take any remedial actions authorized by 22 USC § 7104b(c), without penalty, if any private entity under this grant:

a) is determined to have violated a prohibition in paragraph 2.a. (PoP) of this grant; or

b) has an employee that is determined to have violated a prohibition in paragraph 2.a. (PoP) of this grant through conduct that is either:

1. Associated with the performance under this grant; or
2. Imputed to the recipient or the subrecipient using the standards and due process for imputing the conduct of an individual to an organization that are provided in 2 CFR Part 180, "OMB Guidelines to Agencies on Government-wide Debarment and Suspension (Nonprocurement)," as implemented by the FAA at 2 CFR Part 1200.

c. *Provisions applicable to a sponsor other than a private entity.*

i. The FAA may unilaterally terminate this award or take any remedial actions authorized by 22 USC § 7104b(c), without penalty, if subrecipient is a private entity under this grant:

a) is determined to have violated a prohibition in paragraph 2.a. (PoP) of this grant or

b) has an employee that is determined to have violated a prohibition in paragraph 2.a. (PoP) of this grant through conduct that is either:

1. Associated with the performance under this grant; or
2. Imputed to the sponsor or subrecipient using the standards and due process for imputing the conduct of an individual to an organization that are provided in 2 CFR Part 180, "OMB Guidelines to Agencies on Government-wide Debarment and Suspension (Nonprocurement)," as implemented by the FAA at 2 CFR Part 1200.

d. Provisions applicable to any sponsor or subrecipient.

i. The sponsor or subrecipient must inform the FAA and the DOT Inspector General immediately of any information you receive from any source alleging a violation of a prohibition in paragraph 2.a. (PoP) of this grant.

ii. The FAA's right to unilaterally terminate this grant as described in paragraphs 2.b. (Budget Period) or 3.a. (Close Out and Termination) of this grant, implements the requirements of 22 USC Chapter 78, and is in addition to all other remedies for noncompliance that are available to the FAA under this grant.

iii. The sponsor must include the requirements of paragraph 2.a. (PoP) of this grant award term in any subaward it makes to a private entity.

iv. If applicable, the sponsor must also comply with the compliance plan and certification requirements in 2 CFR § 175.105(b).

e. *Definitions. For purposes of this grant award, term:*

i. "Employee" means either:

a) An individual employed by the sponsor or a subrecipient who is engaged in the performance of the project or program under this grant; or

b) Another person engaged in the performance of the project or program under this grant and not compensated by the sponsor or a subrecipient including, but not limited to, a volunteer or individual whose services are contributed by a third party as an in-kind contribution toward cost sharing requirements.

ii. "Private Entity" means:

a) Any entity, including for-profit organizations, nonprofit organizations, institutions of higher education, and hospitals. The term does not include foreign public entities, Indian Tribes, local governments, or states as defined in 2 CFR § 200.1.

b) The terms "severe forms of trafficking in persons," "commercial sex act," "sex trafficking," "abuse or threatened abuse of law or legal process," "coercion," "debt bondage," and "involuntary servitude" have the meanings given at section 103 of the Victims of Trafficking and Violence Protection Act of 2000, as amended (22 USC § 7102).

23. Grant Funded Work Included in a PFC Application. Within 120 days of acceptance of this Grant Agreement, the sponsor must submit to the FAA an amendment to any approved Passenger Facility Charge (PFC) application that contains an approved PFC project also covered under this Grant Agreement as described in the project application. The sponsor may not make any expenditure under this Grant Agreement until project work addressed under this Grant Agreement is removed from an approved PFC application by amendment.

24. Exhibit "A" Property Map. The Exhibit "A" Property Map dated January 6, 2022, is incorporated herein by reference, or is submitted with the project application and made part of this Grant Agreement.

25. Employee Protection from Reprisal. In accordance with 2 CFR § 200.217 and 41 USC § 4701, an employee of a grantee, subgrantee contractor, recipient, or subrecipient must not be discharged, demoted, or otherwise discriminated against as a reprisal for disclosing to a person or body described in 41 USC § 4712(a)(2) information that the employee reasonably believes is evidence of gross mismanagement of a federal contract or grant, a gross waste of federal funds, an abuse of authority relating to a federal contract or grant, a substantial and specific danger to public health or safety, or a violation of law, rule, or regulation related to a federal contract (including the competition for or negotiation of a contract) or grant. The grantee, subgrantee, contractor, recipient, or subrecipient must inform their employees in writing of employee whistleblower rights and protections under 41 USC § 4712. See statutory requirements for whistleblower protections at 10 USC § 4701, 41 USC § 4712, 41 USC § 4304, and 10 USC § 4310.

26. Prohibited Telecommunications and Video Surveillance Services and Equipment. The sponsor agrees to comply with mandatory standards and policies relating to use and procurement of certain telecommunications and video surveillance services or equipment in compliance with the National Defense Authorization Act [P.L. 115-232 § 889] and 2 CFR § 200.216.

27. **Critical Infrastructure Security and Resilience.** The sponsor acknowledges that it has considered and addressed physical and cybersecurity and resilience in its project planning, design, and oversight, as determined by the DOT and the Department of Homeland Security (DHS). For airports that do not have specific DOT or DHS cybersecurity requirements, the FAA encourages the voluntary adoption of the cybersecurity requirements from the Transportation Security Administration and Federal Security Director identified for security risk Category X airports.

28. **Title VI of the Civil Rights Act.** As a condition of a grant award, the sponsor shall demonstrate that it complies with the provisions of Title VI of the Civil Rights Act of 1964 (42 USC §§ 2000d et seq.) and implementing regulations (49 CFR Part 21), the Airport and Airway Improvement Act of 1982 (49 USC § 47123), the Age Discrimination Act of 1975 (42 USC § 6101 et seq.), Section 504 of the Rehabilitation Act of 1973 (29 USC § 794 et seq.), the Americans with Disabilities Act of 1990 (42 USC § 12101, et seq.), U.S. Department of Transportation and Federal Aviation Administration (FAA) Assurances, and other relevant civil rights statutes, regulations, or authorities, including any amendments or updates thereto. This may include, as applicable, providing a current Title VI Program Plan to the FAA for approval, in the format and according to the timeline required by the FAA, and other information about the communities that will be benefited and impacted by the project. The sponsor shall affirmatively ensure that when carrying out any project supported by this grant that it complies with all federal nondiscrimination and civil rights laws based on race, color, national origin, sex, creed, age, disability, and genetic information, in consideration for federal financial assistance. The Department's and FAA's Office of Civil Rights may provide resources and technical assistance to recipients to ensure full and sustainable compliance with federal civil rights requirements. Failure to comply with civil rights requirements will be considered a violation of the agreement or contract and be subject to any enforcement action as authorized by law.

29. **Applicable Federal Anti-Discrimination Laws.** The sponsor agrees:

    a. That its compliance in all respects with all applicable federal anti-discrimination laws is material to the government's payment decisions for purposes of 31 USC § 3729(b)(4) and

    b. To certify that it does not operate any programs promoting Diversity, Equity, and Inclusion (DEI) that violate any applicable federal anti-discrimination laws.

30. **National Airspace System Requirements.**

    a. The sponsor shall cooperate with FAA activities installing, maintaining, replacing, improving, or operating equipment and facilities in or supporting the National Airspace System, including waiving permitting requirements and other restrictions affecting those activities to the maximum extent possible, and assisting the FAA in securing waivers of permitting or other restrictions from other authorities. The sponsor shall not take actions that frustrate or prevent the FAA from installing, maintaining, replacing, improving, or operating equipment and facilities in or supporting the National Airspace System.

    b. If FAA determines that the sponsor has violated subsection a., the FAA may impose a remedy, including:

        i. Additional conditions on the award;

        ii. Consistent with 49 USC Chapter 471, any remedy permitted under 2 CFR §§ 200.339–200.340, including withholding of payments; disallowance of previously reimbursed costs, requiring refunds from the recipient to the DOT; suspension or termination of the award; or suspension and debarment under 2 CFR part 180; or

iii. Any other remedy legally available.

c. In imposing a remedy under this condition, the FAA may elect to consider the interests of only the FAA.

d. The sponsor acknowledges that amounts that the FAA requires the sponsor to refund to the FAA due to a remedy under this condition constitute a debt to the Federal Government that the FAA may collect under 2 CFR 200.346 and the Federal Claims Collection Standards (31 CFR Parts 900–904).

31. Signage Costs for Construction Projects. The sponsor agrees that it will require the prime contractor of a federally-assisted airport improvement project to post signs consistent with a DOT/FAA-prescribed format, as may be requested by the DOT/FAA, and further agrees to remove any signs posted in response to requests received prior to February 1, 2025.

SPECIAL CONDITIONS

32. Solid Waste Recycling Plan. The sponsor certifies that it has a solid waste recycling plan as part of an existing Airport Master Plan, as prescribed by 49 USC § 47106(a)(6).

33. Maintenance Project Life. The sponsor agrees that pavement maintenance is limited to those aircraft pavements that are in sound condition that they do not warrant extensive work, such as reconstruction or overlays in the immediate or near future. The sponsor further agrees that AIP, Airport Infrastructure Grant (AIG), or supplemental appropriation funding for the pavements maintained under this project will not be requested for more substantial type rehabilitation (more substantial than periodic maintenance) for a 5-year period following the completion of this project unless the FAA determines that the rehabilitation or reconstruction is required for safety reasons.

34. Buy American Executive Orders. The sponsor agrees to abide by applicable Executive Orders in effect at the time this Grant Agreement is executed, including Executive Order 14005, Ensuring the Future Is Made in All of America by All of America's Workers.

35. Usable Unit of Development. The FAA and the sponsor agree this grant only funds a portion of the overall project. The FAA makes no commitment of funding beyond what is provided herein. In accepting this award, the sponsor understands and agrees that the work described in this Grant Agreement must be incorporated into a safe, useful, and usable unit of development completed within a reasonable timeframe [49 USC § 47106(a)(4)]. This safe, useful, usable unit of development must be completed regardless of whether the sponsor receives any additional federal funding.

The sponsor's acceptance of this offer and ratification and adoption of the Project Application incorporated herein shall be evidenced by execution of this instrument by the sponsor, as hereinafter provided, and this offer and acceptance shall comprise a Grant Agreement, constituting the contractual obligations and rights of the United States and the sponsor with respect to the accomplishment of the project and compliance with the Grant Assurances, terms, and conditions as provided herein. Such Grant Agreement shall become effective upon the sponsor's acceptance of this offer.

Please read the following information: By signing this document, you are agreeing that you have reviewed the following consumer disclosure information and consent to transact business using electronic communications, to receive notices and disclosures electronically, and to utilize electronic signatures in lieu of using paper documents. You are not required to receive notices and disclosures or sign documents electronically. If you prefer not to do so, you may request to receive paper copies and withdraw your consent at any time.

I declare under penalty of perjury that the foregoing is true and correct.[1]

UNITED STATES OF AMERICA
FEDERAL AVIATION ADMINISTRATION

{{Sig_es_:signer1:signature:dimension(height=12mm, width=70mm)}}

(Signature)

{{N_es_:signer1:fullname }}

(Typed Name)

{{N_es_:signer1:title }}

(Title of FAA Official)

[1] Knowingly and willfully providing false information to the Federal government is a violation of 18 U.S.C. § 1001 (False Statements) and could subject you to fines, imprisonment, or both.

Part II - Acceptance

The sponsor does hereby ratify and adopt all assurances, statements, representations, warranties, covenants, and agreements contained in the Project Application and incorporated materials referred to in the foregoing offer, and does hereby accept this offer and by such acceptance agrees to comply with all of the Grant Assurances, terms, and conditions in this offer and in the Project Application.

Please read the following information: By signing this document, you are agreeing that you have reviewed the following consumer disclosure information and consent to transact business using electronic communications, to receive notices and disclosures electronically, and to utilize electronic signatures in lieu of using paper documents. You are not required to receive notices and disclosures or sign documents electronically. If you prefer not to do so, you may request to receive paper copies and withdraw your consent at any time.

I declare under penalty of perjury that the foregoing is true and correct.[2]

Dated **{{DateTime_es_:signer2:calc(now()):format(date," mmmm d, yyyy")}}**

CITY OF PUEBLO, COLORADO

(Name of Sponsor)

{{Sig_es_:signer2:signature:dimension(height=12mm, width=70mm)}}

(Signature of Sponsor's Authorized Official)

By: **{{N_es_:signer2:fullname }}**

(Typed Name of Sponsor's Authorized Official)

Title: **{{*Ttl_es_:signer2:title }}**

(Title of Sponsor's Authorized Official)

[2] Knowingly and willfully providing false information to the Federal Government is a violation of 18 USC § 1001 (False Statements) and could subject you to fines, imprisonment, or both.

CERTIFICATE OF SPONSOR'S ATTORNEY

I, **{{N_es_:signer3: fullname}}**, acting as Attorney for the Sponsor do hereby certify:

That in my opinion the Sponsor is empowered to enter into the foregoing Grant Agreement under the laws of the State of __Colorado__. Further, I have examined the foregoing Grant Agreement and the actions taken by said Sponsor and Sponsor's official representative, who has been duly authorized to execute this Grant Agreement, which is in all respects due and proper and in accordance with the laws of the said State; and Title 49, United States Code (USC), Chapters 471 and 475; 49 USC §§ 40101 et seq., and 48103; Consolidated Appropriations Act, 2024 (P.L. 118-42); Consolidated Appropriations Act, 2025 (P.L. 119-4); Consolidated Appropriations Act, 2026 (P.L. 119-75); FAA Reauthorization Act of 2024 (P.L. 118-63); and the representations contained in the Project Application. In addition, for grants involving projects to be carried out on property not owned by the Sponsor, there are no legal impediments that will prevent full performance by the Sponsor. Further, it is my opinion that the said Grant Agreement constitutes a legal and binding obligation of the Sponsor in accordance with the terms thereof.

Please read the following information: By signing this document, you are agreeing that you have reviewed the following consumer disclosure information and consent to transact business using electronic communications, to receive notices and disclosures electronically, and to utilize electronic signatures in lieu of using paper documents. You are not required to receive notices and disclosures or sign documents electronically. If you prefer not to do so, you may request to receive paper copies and withdraw your consent at any time.

I declare under penalty of perjury that the foregoing is true and correct.[3]

Dated at **{{DateTime_es_:signer3:calc(now()):format(date," mmmm d, yyyy")}}**

By: {{Sig_es_:signer3:signature:dimension(height=12mm, width=70mm}}

(Signature of Sponsor's Attorney)

[3] Knowingly and willfully providing false information to the Federal Government is a violation of 18 USC § 1001 (False Statements) and could subject you to fines, imprisonment, or both.

ASSURANCES
AIRPORT SPONSORS

A. General.

1. These assurances shall be complied with in the performance of grant agreements for airport development, airport planning, and noise compatibility program grants for airport sponsors.
2. These assurances are required to be submitted as part of the project application by sponsors requesting funds under the provisions of Title 49, USC, subtitle VII, as amended. As used herein, the term "public agency sponsor" means a public agency with control of a public-use airport; the term "private sponsor" means a private owner of a public-use airport; and the term "sponsor" includes both public agency sponsors and private sponsors.
3. Upon acceptance of this Grant Offer by the sponsor, these assurances are incorporated in and become part of this Grant Agreement.

B. Duration and Applicability.

1. Airport Development or Noise Compatibility Program Projects Undertaken by a Public Agency Sponsor.

The terms, conditions and assurances of this Grant Agreement shall remain in full force and effect throughout the useful life of the facilities developed or equipment acquired for an airport development or noise compatibility program project, or throughout the useful life of the project items installed within a facility under a noise compatibility program project, but in any event not to exceed twenty (20) years from the date of acceptance of a Grant Offer of federal funds for the project. However, there shall be no limit on the duration of the assurances regarding Exclusive Rights and Airport Revenue so long as the airport is used as an airport. There shall be no limit on the duration of the terms, conditions, and assurances with respect to real property acquired with federal funds. Furthermore, the duration of the Civil Rights assurance shall be specified in the assurances.

2. Airport Development or Noise Compatibility Projects Undertaken by a Private Sponsor.

The preceding paragraph (1) also applies to a private sponsor except that the useful life of project items installed within a facility or the useful life of the facilities developed or equipment acquired under an airport development or noise compatibility program project shall be no less than ten (10) years from the date of acceptance of federal aid for the project.

3. Airport Planning Undertaken by a Sponsor.

Unless otherwise specified in this Grant Agreement, only Assurances 1, 2, 3, 5, 6, 13, 18, 23, 25, 30, 32, 33, 34, 37, and 40 in Section C apply to planning projects. The terms, conditions, and assurances of this Grant Agreement shall remain in full force and effect during the life of the project; there shall be no limit on the duration of the assurances regarding Exclusive Rights and Airport Revenue so long as the airport is used as an airport.

C. Sponsor Certification.

The sponsor hereby assures and certifies, with respect to this grant that:

1. General Federal Requirements

It will comply with all applicable federal laws, regulations, executive orders, policies, guidelines, and requirements as they relate to the application, acceptance, and use of federal funds for this grant. Performance under this agreement shall be governed by and in compliance with the following requirements, as applicable, to the type of organization of the Sponsor and any applicable sub-recipients. The applicable provisions to this agreement include, but are not limited to, the following:

FEDERAL LEGISLATION

a. 49 USC subtitle VII, as amended.
b. Davis-Bacon Act, as amended — 40 USC §§ 3141-3144, 3146, and 3147, et seq.[1]
c. Federal Fair Labor Standards Act – 29 USC § 201, et seq.
d. Hatch Act – 5 USC § 1501, et seq.[2]
e. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 42 USC § 4601, et seq.[1, 2]
f. National Historic Preservation Act of 1966 – Section 106 – 54 USC § 306108.[1]
g. Archeological and Historic Preservation Act of 1974 – 54 USC § 312501, et seq.[1]
h. Native Americans Grave Repatriation Act – 25 USC § 3001, et seq.
i. Clean Air Act, P.L. 90-148, as amended – 42 USC § 7401, et seq.
j. Coastal Zone Management Act, P.L. 92-583, as amended – 16 USC § 1451, et seq.
k. Flood Disaster Protection Act of 1973 – Section 102(a) - 42 USC § 4012a.[1]
l. 49 USC § 303, (formerly known as Section 4(f)).
m. Rehabilitation Act of 1973 – 29 USC § 794.
n. Title VI of the Civil Rights Act of 1964 (42 USC § 2000d et seq.) (prohibits discrimination on the basis of race, color, national origin).
o. Americans with Disabilities Act of 1990, as amended, (42 USC § 12101 et seq.) (prohibits discrimination on the basis of disability).
p. Age Discrimination Act of 1975 – 42 USC § 6101, et seq.
q. American Indian Religious Freedom Act, P.L. 95-341, as amended.
r. Architectural Barriers Act of 1968, as amended – 42 USC § 4151, et seq.[1]
s. Powerplant and Industrial Fuel Use Act of 1978 – Section 403 – 42 USC § 8373.[1]
t. Contract Work Hours and Safety Standards Act – 40 USC § 3701, et seq.[1]
u. Copeland Anti-kickback Act – 18 USC § 874.[1]

v. National Environmental Policy Act of 1969 – 42 USC § 4321, et seq.[1]

w. Wild and Scenic Rivers Act, P.L. 90-542, as amended – 16 USC § 1271, et seq.

x. Single Audit Act of 1984 – 31 USC § 7501, et seq.[2]

y. Drug-Free Workplace Act of 1988 – 41 USC §§ 8101 through 8105.

z. The Federal Funding Accountability and Transparency Act of 2006, as amended (P.L. 109-282, as amended by section 6202 of P.L. 110-252).

aa. Civil Rights Restoration Act of 1987, P.L. 100-259.

bb. Infrastructure Investment and Jobs Act, P.L. 117-58, Title VIII.

cc. Build America, Buy America Act, P.L. 117-58, Title IX.

dd. Endangered Species Act – 16 USC 1531, et seq.

ee. Title IX of the Education Amendments of 1972, as amended – 20 USC 1681–1683 and 1685–1687.

ff. Drug Abuse Office and Treatment Act of 1972, as amended – 21 USC 1101, et seq.

gg. Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, P.L. 91-616, as amended – 42 USC § 4541, et seq.

hh. Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, P.L. 91-616, as amended – 42 USC § 4541, et seq.

ii. Appropriated Funds to Influence Certain Federal Contracting and Financial Transactions – 31 USC § 1352.

EXECUTIVE ORDERS

a. Executive Order 11990 – Protection of Wetlands

b. Executive Order 11988 – Floodplain Management

c. Executive Order 12372 – Intergovernmental Review of Federal Programs

d. Executive Order 12699 – Seismic Safety of Federal and Federally Assisted New Building Construction[1]

e. Executive Order 14005 – Ensuring the Future is Made in all of America by All of America's Workers

f. Executive Order 14149 – Restoring Freedom of Speech and Ending Federal Censorship

g. Executive Order 14151 – Ending Radical and Wasteful Government DEI Programs and Preferencing

h. Executive Order 14154 – Unleashing American Energy

i. Executive Order 14168 – Defending Women from Gender Ideology Extremism and Restoring Biological Truth to the Federal Government

j. Executive Order 14173 – Ending Illegal Discrimination and Restoring Merit-Based Opportunity

FEDERAL REGULATIONS

a. 2 CFR Part 180 – OMB Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement).

b. 2 CFR Part 200 and 1201 – Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards. [3, 4, 5]

c. 2 CFR Part 1200 – Nonprocurement Suspension and Debarment.

d. 14 CFR Part 13 – Investigative and Enforcement Procedures.

e. 14 CFR Part 16 – Rules of Practice for Federally-Assisted Airport Enforcement Proceedings.

f. 14 CFR Part 150 – Airport Noise Compatibility Planning.

g. 28 CFR Part 35 – Nondiscrimination on the Basis of Disability in State and Local Government Services.

h. 28 CFR § 50.3 – U.S. Department of Justice Guidelines for the Enforcement of Title VI of the Civil Rights Act of 1964.

i. 29 CFR Part 1 – Procedures for Predetermination of Wage Rates.[1]

j. 29 CFR Part 3 – Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States.[1]

k. 29 CFR Part 5 – Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction (Also Labor Standards Provisions Applicable to Nonconstruction Contracts Subject to the Contract Work Hours and Safety Standards Act).[1]

l. 41 CFR Part 60 – Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor (Federal and Federally-assisted contracting requirements).[1]

m. 49 CFR Part 20 – New Restrictions on Lobbying.

n. 49 CFR Part 21 – Nondiscrimination in Federally-Assisted Programs of the Department of Transportation - Effectuation of Title VI of the Civil Rights Act of 1964.

o. 49 CFR Part 23 – Participation by Disadvantage Business Enterprise in Airport Concessions.

p. 49 CFR Part 24 – Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally-Assisted Programs.[1, 2]

q. 49 CFR Part 26 – Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs.

r. 49 CFR Part 27 – Nondiscrimination on the Basis of Disability in Programs or Activities Receiving Federal Financial Assistance.[1]

s. 49 CFR Part 28 – Enforcement of Nondiscrimination on the Basis of Handicap in Programs or Activities Conducted by the Department of Transportation.

t. 49 CFR Part 30 – Denial of Public Works Contracts to Suppliers of Goods and Services of Countries That Deny Procurement Market Access to U.S. Contractors.

u. 49 CFR Part 32 – Governmentwide Requirements for Drug-Free Workplace (Financial Assistance).

v. 49 CFR Part 37 – Transportation Services for Individuals with Disabilities (ADA).

w. 49 CFR Part 38 – Americans with Disabilities Act (ADA) Accessibility Specifications for Transportation Vehicles.

x. 49 CFR Part 41 – Seismic Safety.

FOOTNOTES TO ASSURANCE (C)(1)

[1] These laws do not apply to airport planning sponsors.
[2] These laws do not apply to private sponsors.
[3] 2 CFR Part 200 contains requirements for state and local governments receiving federal assistance. Any requirement levied upon state and local governments by this regulation shall apply where applicable to private sponsors receiving federal assistance under Title 49, United States Code.
[4] Cost principles established in 2 CFR Part 200 subpart E must be used as guidelines for determining the eligibility of specific types of expenses.
[5] Audit requirements established in 2 CFR Part 200 subpart F are the guidelines for audits.

SPECIFIC ASSURANCES

Specific assurances required to be included in grant agreements by any of the above laws, regulations or circulars are incorporated by reference in this Grant Agreement.

2. Responsibility and Authority of the Sponsor.

a. Public Agency Sponsor:

It has legal authority to apply for this grant, and to finance and carry out the proposed project; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing body authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.

b. Private Sponsor:

It has legal authority to apply for this grant and to finance and carry out the proposed project and comply with all terms, conditions, and assurances of this Grant Agreement. It shall designate an official representative and shall in writing direct and authorize that person to file this application, including all understandings and assurances contained therein; to act in connection with this application; and to provide such additional information as may be required.

3. Sponsor Fund Availability.

It has sufficient funds available for that portion of the project costs which are not to be paid by the United States. It has sufficient funds available to assure operation and maintenance of items funded under this Grant Agreement which it will own or control.

4. Good Title.

a. It, a public agency or the Federal Government, holds good title, satisfactory to the Secretary, to the landing area of the airport or site thereof, or will give assurance satisfactory to the Secretary that good title will be acquired.

b. For noise compatibility program projects to be carried out on the property of the sponsor, it holds good title satisfactory to the Secretary to that portion of the property upon which federal funds will be expended or will give assurance to the Secretary that good title will be obtained.

5. Preserving Rights and Powers.

a. It will not take or permit any action which would operate to deprive it of any of the rights and powers necessary to perform any or all of the terms, conditions, and assurances in this Grant Agreement without the written approval of the Secretary, and will act promptly to acquire, extinguish or modify any outstanding rights or claims of right of others which would interfere with such performance by the sponsor. This shall be done in a manner acceptable to the Secretary.

b. Subject to 49 USC § 47107(a)(16) and (x), it will not sell, lease, encumber, or otherwise transfer or dispose of any part of its title or other interests in the property shown on Exhibit A to this application or, for a noise compatibility program project, that portion of the property upon which federal funds have been expended, for the duration of the terms, conditions, and assurances in this Grant Agreement without approval by the Secretary. If the transferee is found by the Secretary to be eligible under Title 49, United States Code, to assume the obligations of this Grant Agreement and to have the power, authority, and financial resources to carry out all such obligations, the sponsor shall insert in the contract or document transferring or disposing of the sponsor's interest, and make binding upon the transferee all of the terms, conditions, and assurances contained in this Grant Agreement.

c. For all noise compatibility program projects which are to be carried out by another unit of local government or are on property owned by a unit of local government other than the sponsor, it will enter into an agreement with that government. Except as otherwise specified by the Secretary, that agreement shall obligate that government to the same terms, conditions, and assurances that would be applicable to it if it applied directly to the FAA for a grant to undertake the noise compatibility program project. That agreement and changes thereto must be satisfactory to the Secretary. It will take steps to enforce this agreement against the local government if there is substantial non-compliance with the terms of the agreement.

d. For noise compatibility program projects to be carried out on privately owned property, it will enter into an agreement with the owner of that property which includes provisions specified by the Secretary. It will take steps to enforce this agreement against the property owner whenever there is substantial non-compliance with the terms of the agreement.

e. If the sponsor is a private sponsor, it will take steps satisfactory to the Secretary to ensure that the airport will continue to function as a public-use airport in accordance with these assurances for the duration of these assurances.

f. If an arrangement is made for management and operation of the airport by any agency or person other than the sponsor or an employee of the sponsor, the sponsor will reserve sufficient rights and authority to ensure that the airport will be operated and maintained in accordance with Title 49, United States Code, the regulations and the terms, conditions and assurances in this Grant Agreement and shall ensure that such arrangement also requires compliance therewith.

g. Sponsors of commercial service airports will not permit or enter into any arrangement that results in permission for the owner or tenant of a property used as a residence, or zoned for residential use, to taxi an aircraft between that property and any location on airport. Sponsors

of general aviation airports entering into any arrangement that results in permission for the owner of residential real property adjacent to or near the airport must comply with the requirements of Sec. 136 of Public Law 112-95 and the sponsor assurances.

6. Consistency with Local Plans.

The project is reasonably consistent with plans (existing at the time of submission of this application) of public agencies that are authorized by the state in which the project is located to plan for the development of the area surrounding the airport.

7. Consideration of Local Interest.

It has given fair consideration to the interest of communities in or near where the project may be located.

8. Consultation with Users.

In making a decision to undertake any airport development project under Title 49, United States Code, it has undertaken reasonable consultations with affected parties using the airport at which project is proposed.

9. Public Hearings.

In projects involving the location of an airport, an airport runway, or a major runway extension, it has afforded the opportunity for public hearings for the purpose of considering the economic, social, and environmental effects of the airport or runway location and its consistency with goals and objectives of such planning as has been carried out by the community and it shall, when requested by the Secretary, submit a copy of the transcript of such hearings to the Secretary. Further, for such projects, it has on its management board either voting representation from the communities where the project is located or has advised the communities that they have the right to petition the Secretary concerning a proposed project.

10. Metropolitan Planning Organization.

In projects involving the location of an airport, an airport runway, or a major runway extension at a medium or large hub airport, the sponsor has made available to and has provided upon request to the metropolitan planning organization in the area in which the airport is located, if any, a copy of the proposed amendment to the airport layout plan to depict the project and a copy of any airport master plan in which the project is described or depicted.

11. Pavement Preventive Maintenance-Management.

With respect to a project approved after January 1, 1995, for the replacement or reconstruction of pavement at the airport, it assures or certifies that it has implemented an effective airport pavement maintenance-management program and it assures that it will use such program for the useful life of any pavement constructed, reconstructed or repaired with federal financial assistance at the airport. It will provide such reports on pavement condition and pavement management programs as the Secretary determines may be useful.

12. Terminal Development Prerequisites.

For projects which include terminal development at a public use airport, as defined in Title 49, it has, on the date of submittal of the project grant application, all the safety equipment required for certification of such airport under 49 USC § 44706, and all the security equipment required by rule or regulation, and has provided for access to the passenger enplaning and deplaning area of such airport to passengers enplaning and deplaning from aircraft other than air carrier aircraft.

13. Accounting System, Audit, and Record Keeping Requirements.

a. It shall keep all project accounts and records which fully disclose the amount and disposition by the recipient of the proceeds of this grant, the total cost of the project in connection with which this grant is given or used, and the amount or nature of that portion of the cost of the project supplied by other sources, and such other financial records pertinent to the project. The accounts and records shall be kept in accordance with an accounting system that will facilitate an effective audit in accordance with the Single Audit Act of 1984.

b. It shall make available to the Secretary and the Comptroller General of the United States, or any of their duly authorized representatives, for the purpose of audit and examination, any books, documents, papers, and records of the recipient that are pertinent to this grant. The Secretary may require that an appropriate audit be conducted by a recipient. In any case in which an independent audit is made of the accounts of a sponsor relating to the disposition of the proceeds of a grant or relating to the project in connection with which this grant was given or used, it shall file a certified copy of such audit with the Comptroller General of the United States not later than six (6) months following the close of the fiscal year for which the audit was made.

14. Minimum Wage Rates.

It shall include, in all contracts in excess of $2,000 for work on any projects funded under this Grant Agreement which involve labor, provisions establishing minimum rates of wages, to be predetermined by the Secretary of Labor under 40 USC §§ 3141-3144, 3146, and 3147, Public Building, Property, and Works), which contractors shall pay to skilled and unskilled labor, and such minimum rates shall be stated in the invitation for bids and shall be included in proposals or bids for the work.

15. Veteran's Preference.

It shall include in all contracts for work on any project funded under this Grant Agreement which involve labor, such provisions as are necessary to insure that, in the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Vietnam era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns owned and controlled by disabled veterans as defined in 49 USC § 47112. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.

16. Conformity to Plans and Specifications.

It will execute the project subject to plans, specifications, and schedules approved by the Secretary. Such plans, specifications, and schedules shall be submitted to the Secretary prior to commencement of site preparation, construction, or other performance under this Grant Agreement, and, upon approval of the Secretary, shall be incorporated into this Grant Agreement. Any modification to the approved plans, specifications, and schedules shall also be subject to approval of the Secretary, and incorporated into this Grant Agreement.

17. Construction Inspection and Approval.

It will provide and maintain competent technical supervision at the construction site throughout the project to assure that the work conforms to the plans, specifications, and schedules approved by the Secretary for the project. It shall subject the construction work on any project contained in an approved project application to inspection and approval by the Secretary and such work shall be in

accordance with regulations and procedures prescribed by the Secretary. Such regulations and procedures shall require such cost and progress reporting by the sponsor or sponsors of such project as the Secretary shall deem necessary.

18. Planning Projects.

In carrying out planning projects:

a. It will execute the project in accordance with the approved program narrative contained in the project application or with the modifications similarly approved.

b. It will furnish the Secretary with such periodic reports as required pertaining to the planning project and planning work activities.

c. It will include in all published material prepared in connection with the planning project a notice that the material was prepared under a grant provided by the United States.

d. It will make such material available for examination by the public, and agrees that no material prepared with funds under this project shall be subject to copyright in the United States or any other country.

e. It will give the Secretary unrestricted authority to publish, disclose, distribute, and otherwise use any of the material prepared in connection with this grant.

f. It will grant the Secretary the right to disapprove the sponsor's employment of specific consultants and their subcontractors to do all or any part of this project as well as the right to disapprove the proposed scope and cost of professional services.

g. It will grant the Secretary the right to disapprove the use of the sponsor's employees to do all or any part of the project.

h. It understands and agrees that the Secretary's approval of this project grant or the Secretary's approval of any planning material developed as part of this grant does not constitute or imply any assurance or commitment on the part of the Secretary to approve any pending or future application for a federal airport grant.

19. Operation and Maintenance.

a. The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state, and local agencies for maintenance and operation. It will not cause or permit any activity or action thereon which would interfere with its use for airport purposes. It will suitably operate and maintain the airport and all facilities thereon or connected therewith, with due regard to climatic and flood conditions. Any proposal to temporarily close the airport for non-aeronautical purposes must first be approved by the Secretary. In furtherance of this assurance, the sponsor will have in effect arrangements for:

   1. Operating the airport's aeronautical facilities whenever required;

   2. Promptly marking and lighting hazards resulting from airport conditions, including temporary conditions; and

   3. Promptly notifying pilots of any condition affecting aeronautical use of the airport. Nothing contained herein shall be construed to require that the airport be operated for aeronautical use during temporary periods when snow, flood, or other climatic conditions

interfere with such operation and maintenance. Further, nothing herein shall be construed as requiring the maintenance, repair, restoration, or replacement of any structure or facility which is substantially damaged or destroyed due to an act of God or other condition or circumstance beyond the control of the sponsor.

b. It will suitably operate and maintain noise compatibility program items that it owns or controls upon which federal funds have been expended.

20. Hazard Removal and Mitigation.

It will take appropriate action to ensure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.

21. Compatible Land Use.

It will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which federal funds have been expended.

22. Economic Nondiscrimination.

a. It will make the airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical activities, including commercial aeronautical activities offering services to the public at the airport.

b. In any agreement, contract, lease, or other arrangement under which a right or privilege at the airport is granted to any person, firm, or corporation to conduct or to engage in any aeronautical activity for furnishing services to the public at the airport, the sponsor will insert and enforce provisions requiring the contractor to:

1. Furnish said services on a reasonable, and not unjustly discriminatory, basis to all users thereof, and

2. Charge reasonable, and not unjustly discriminatory, prices for each unit or service, provided that the contractor may be allowed to make reasonable and nondiscriminatory discounts, rebates, or other similar types of price reductions to volume purchasers.

c. Each fixed-based operator at the airport shall be subject to the same rates, fees, rentals, and other charges as are uniformly applicable to all other fixed-based operators making the same or similar uses of such airport and utilizing the same or similar facilities.

d. Each air carrier using such airport shall have the right to service itself or to use any fixed-based operator that is authorized or permitted by the airport to serve any air carrier at such airport.

e. Each air carrier using such airport (whether as a tenant, non-tenant, or subtenant of another air carrier tenant) shall be subject to such nondiscriminatory and substantially comparable rules, regulations, conditions, rates, fees, rentals, and other charges with respect to facilities directly and substantially related to providing air transportation as are applicable to all such air carriers

which make similar use of such airport and utilize similar facilities, subject to reasonable classifications such as tenants or non-tenants and signatory carriers and non-signatory carriers. Classification or status as tenant or signatory shall not be unreasonably withheld by any airport provided an air carrier assumes obligations substantially similar to those already imposed on air carriers in such classification or status.

f. It will not exercise or grant any right or privilege which operates to prevent any person, firm, or corporation operating aircraft on the airport from performing any services on its own aircraft with its own employees (including, but not limited to maintenance, repair, and fueling) that it may choose to perform.

g. In the event the sponsor itself exercises any of the rights and privileges referred to in this assurance, the services involved will be provided on the same conditions as would apply to the furnishing of such services by commercial aeronautical service providers authorized by the sponsor under these provisions.

h. The sponsor may establish such reasonable, and not unjustly discriminatory, conditions to be met by all users of the airport as may be necessary for the safe and efficient operation of the airport.

i. The sponsor may prohibit or limit any given type, kind or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport or necessary to serve the civil aviation needs of the public.

23. Exclusive Rights.

It will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. For purposes of this paragraph, the providing of the services at an airport by a single fixed-based operator shall not be construed as an exclusive right if both of the following apply:

a. It would be unreasonably costly, burdensome, or impractical for more than one fixed-based operator to provide such services, and

b. If allowing more than one fixed-based operator to provide such services would require the reduction of space leased pursuant to an existing agreement between such single fixed-based operator and such airport. It further agrees that it will not, either directly or indirectly, grant or permit any person, firm, or corporation, the exclusive right at the airport to conduct any aeronautical activities, including, but not limited to charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations, aircraft sales and services, sale of aviation petroleum products whether or not conducted in conjunction with other aeronautical activity, repair and maintenance of aircraft, sale of aircraft parts, and any other activities which because of their direct relationship to the operation of aircraft can be regarded as an aeronautical activity, and that it will terminate any exclusive right to conduct an aeronautical activity now existing at such an airport before the grant of any assistance under Title 49, United States Code.

24. Fee and Rental Structure.

It will maintain a fee and rental structure for the facilities and services at the airport which will make the airport as self-sustaining as possible under the circumstances existing at the particular airport, taking into account such factors as the volume of traffic and economy of collection. No part of the federal share of an airport development, airport planning or noise compatibility project for

which a grant is made under Title 49, United States Code, the Airport and Airway Improvement Act of 1982, the Federal Airport Act or the Airport and Airway Development Act of 1970 shall be included in the rate basis in establishing fees, rates, and charges for users of that airport.

25. Airport Revenues.

a. All revenues generated by the airport and any local taxes on aviation fuel established after December 30, 1987, will be expended by it for the capital or operating costs of the airport; the local airport system; or other local facilities which are owned or operated by the owner or operator of the airport and which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes on or off the airport. The following exceptions apply to this paragraph:

   1. If covenants or assurances in debt obligations issued before September 3, 1982, by the owner or operator of the airport, or provisions enacted before September 3, 1982, in governing statutes controlling the owner or operator's financing, provide for the use of the revenues from any of the airport owner or operator's facilities, including the airport, to support not only the airport but also the airport owner or operator's general debt obligations or other facilities, then this limitation on the use of all revenues generated by the airport (and, in the case of a public airport, local taxes on aviation fuel) shall not apply.

   2. If the Secretary approves the sale of a privately owned airport to a public sponsor and provides funding for any portion of the public sponsor’s acquisition of land, this limitation on the use of all revenues generated by the sale shall not apply to certain proceeds from the sale. This is conditioned on repayment to the Secretary by the private owner of an amount equal to the remaining unamortized portion (amortized over a 20-year period) of any airport improvement grant made to the private owner for any purpose other than land acquisition on or after October 1, 1996, plus an amount equal to the federal share of the current fair market value of any land acquired with an airport improvement grant made to that airport on or after October 1, 1996.

   3. Certain revenue derived from or generated by mineral extraction, production, lease, or other means at a general aviation airport (as defined at 49 USC § 47102), if the FAA determines the airport sponsor meets the requirements set forth in Section 813 of Public Law 112-95.

b. As part of the annual audit required under the Single Audit Act of 1984, the sponsor will direct that the audit will review, and the resulting audit report will provide an opinion concerning, the use of airport revenue and taxes in paragraph (a), and indicating whether funds paid or transferred to the owner or operator are paid or transferred in a manner consistent with Title 49, United States Code and any other applicable provision of law, including any regulation promulgated by the Secretary or Administrator.

c. Any civil penalties or other sanctions will be imposed for violation of this assurance in accordance with the provisions of 49 USC § 47107.

26. Reports and Inspections.

It will:

a. submit to the Secretary such annual or special financial and operations reports as the Secretary may reasonably request and make such reports available to the public; make available to the

public at reasonable times and places a report of the airport budget in a format prescribed by the Secretary;

b. for airport development projects, make the airport and all airport records and documents affecting the airport, including deeds, leases, operation and use agreements, regulations and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request;

c. for noise compatibility program projects, make records and documents relating to the project and continued compliance with the terms, conditions, and assurances of this Grant Agreement including deeds, leases, agreements, regulations, and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request; and

d. in a format and time prescribed by the Secretary, provide to the Secretary and make available to the public following each of its fiscal years, an annual report listing in detail:

   1. all amounts paid by the airport to any other unit of government and the purposes for which each such payment was made; and

   2. all services and property provided by the airport to other units of government and the amount of compensation received for provision of each such service and property.

27. Use by Government Aircraft.

It will make available all of the facilities of the airport developed with federal financial assistance and all those usable for landing and takeoff of aircraft to the United States for use by Government aircraft in common with other aircraft at all times without charge, except, if the use by Government aircraft is substantial, charge may be made for a reasonable share, proportional to such use, for the cost of operating and maintaining the facilities used. Unless otherwise determined by the Secretary, or otherwise agreed to by the sponsor and the using agency, substantial use of an airport by Government aircraft will be considered to exist when operations of such aircraft are in excess of those which, in the opinion of the Secretary, would unduly interfere with use of the landing areas by other authorized aircraft, or during any calendar month that:

a. Five (5) or more Government aircraft are regularly based at the airport or on land adjacent thereto; or

b. The total number of movements (counting each landing as a movement) of Government aircraft is 300 or more, or the gross accumulative weight of Government aircraft using the airport (the total movement of Government aircraft multiplied by gross weights of such aircraft) is in excess of five million pounds.

28. Land for Federal Facilities.

It will furnish without cost to the Federal Government for use in connection with any air traffic control or air navigation activities, or weather-reporting and communication activities related to air traffic control, any areas of land or water, or estate therein as the Secretary considers necessary or desirable for construction, operation, and maintenance at federal expense of space or facilities for such purposes. Such areas or any portion thereof will be made available as provided herein within four months after receipt of a written request from the Secretary.

29. Airport Layout Plan.

a. The airport owner or operator will maintain a current airport layout plan of the airport showing:

1. boundaries of the airport and all proposed additions thereto, together with the boundaries of all offsite areas owned or controlled by the sponsor for airport purposes and proposed additions thereto;

2. the location and nature of all existing and proposed airport facilities and structures (such as runways, taxiways, aprons, terminal buildings, hangars and roads), including all proposed extensions and reductions of existing airport facilities;

3. the location of all existing and proposed non-aviation areas and of all existing improvements thereon; and

4. all proposed and existing access points used to taxi aircraft across the airport's property boundary.

b. Subject to subsection 49 USC § 47107(x), the Secretary will review and approve or disapprove the plan and any revision or modification of the plan before the plan, revision, or modification takes effect.

c. The owner or operator will not make or allow any alteration in the airport or any of its facilities unless the alteration—

1. is outside the scope of the Secretary's review and approval authority as set forth in subsection (x); or

2. complies with the portions of the plan approved by the Secretary.

d. When the airport owner or operator makes a change or alteration in the airport or the facilities which the Secretary determines adversely affects the safety, utility, or efficiency of any federally owned, leased, or funded property on or off the airport and which is not in conformity with the airport layout plan as approved by the Secretary, the owner or operator will, if requested, by the Secretary:

1. eliminate such adverse effect in a manner approved by the Secretary; or

2. bear all costs of relocating such property or its replacement to a site acceptable to the Secretary and of restoring the property or its replacement to the level of safety, utility, efficiency, and cost of operation that existed before the alteration was made, except in the case of a relocation or replacement of an existing airport facility due to a change in the Secretary's design standards beyond the control of the airport sponsor.

30. Civil Rights.

It will promptly take any measures necessary to ensure that no person in the United States shall, on the grounds of race, color, and national origin (including limited English proficiency) in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (42 USC §§ 2000d to 2000d-4); creed and sex per 49 USC § 47123 and related requirements; age per the Age Discrimination Act of 1975 and related requirements; or disability per the Americans with Disabilities Act of 1990 and related requirements, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination in any program and activity conducted with, or benefiting from, funds received from this grant.

a. Using the definitions of activity, facility, and program as found and defined in 49 CFR §§ 21.23(b) and 21.23(e), the sponsor will facilitate all programs, operate all facilities, or conduct all programs in compliance with all non-discrimination requirements imposed by or pursuant to these assurances.

b. Applicability

   1. Programs and Activities. If the sponsor has received a grant (or other federal assistance) for any of the sponsor's program or activities, these requirements extend to all of the sponsor's programs and activities.

   2. Facilities. Where it receives a grant or other federal financial assistance to construct, expand, renovate, remodel, alter, or acquire a facility, or part of a facility, the assurance extends to the entire facility and facilities operated in connection therewith.

   3. Real Property. Where the sponsor receives a grant or other federal financial assistance in the form of, or for the acquisition of real property or an interest in real property, the assurance will extend to rights to space on, over, or under such property.

c. Duration.

   The sponsor agrees that it is obligated to this assurance for the period during which federal financial assistance is extended to the program, except where the federal financial assistance is to provide, or is in the form of, personal property, or real property, or interest therein, or structures or improvements thereon, in which case the assurance obligates the sponsor, or any transferee for the longer of the following periods:

   1. So long as the airport is used as an airport, or for another purpose involving the provision of similar services or benefits; or

   2. So long as the sponsor retains ownership or possession of the property.

d. Required Solicitation Language. It will include the following notification in all solicitations for bids, Requests For Proposals for work, or material under this Grant Agreement and in all proposals for agreements, including airport concessions, regardless of funding source:

   "The (**City of Pueblo, Colorado**), in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (42 USC §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders or offerors that it will affirmatively ensure that for any contract entered into pursuant to this advertisement, all businesses will be afforded full and fair opportunity to submit bids in response to this invitation and no businesses will be discriminated against on the grounds of race, color, national origin (including limited English proficiency), creed, sex , age, or disability in consideration for an award."

e. Required Contract Provisions.

   1. It will insert the non-discrimination contract clauses requiring compliance with the acts and regulations relative to non-discrimination in federally-assisted programs of the Department of Transportation (DOT), and incorporating the acts and regulations into the contracts by reference in every contract or agreement subject to the non-discrimination in federally-assisted programs of the DOT acts and regulations.

   2. It will include a list of the pertinent non-discrimination authorities in every contract that is subject to the non-discrimination acts and regulations.

3. It will insert non-discrimination contract clauses as a covenant running with the land, in any deed from the United States effecting or recording a transfer of real property, structures, use, or improvements thereon or interest therein to a sponsor.

4. It will insert non-discrimination contract clauses prohibiting discrimination on the basis of race, color, national origin (including limited English proficiency), creed, sex, age, or disability as a covenant running with the land, in any future deeds, leases, license, permits, or similar instruments entered into by the sponsor with other parties:

   a. For the subsequent transfer of real property acquired or improved under the applicable activity, project, or program; and

   b. For the construction or use of, or access to, space on, over, or under real property acquired or improved under the applicable activity, project, or program.

f. It will provide for such methods of administration for the program as are found by the Secretary to give reasonable guarantee that it, other recipients, sub-recipients, sub-grantees, contractors, subcontractors, consultants, transferees, successors in interest, and other participants of federal financial assistance under such program will comply with all requirements imposed or pursuant to the acts, the regulations, and this assurance.

g. It agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the acts, the regulations, and this assurance.

31. Disposal of Land.

a. For land purchased under a grant for airport noise compatibility purposes, including land serving as a noise buffer, it will dispose of the land, when the land is no longer needed for such purposes, at fair market value, at the earliest practicable time. That portion of the proceeds of such disposition which is proportionate to the United States' share of acquisition of such land will be, at the discretion of the Secretary, (1) reinvested in another project at the airport, or (2) transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order:

   1. Reinvestment in an approved noise compatibility project;

   2. Reinvestment in an approved project that is eligible for grant funding under 49 USC § 47117(e);

   3. Reinvestment in an approved airport development project that is eligible for grant funding under 49 USC §§ 47114, 47115, or 47117;

   4. Transfer to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport; or

   5. Payment to the Secretary for deposit in the Airport and Airway Trust Fund.

   If land acquired under a grant for noise compatibility purposes is leased at fair market value and consistent with noise buffering purposes, the lease will not be considered a disposal of the land. Revenues derived from such a lease may be used for an approved airport development project that would otherwise be eligible for grant funding or any permitted use of airport revenue.

b. For land purchased under a grant for airport development purposes (other than noise compatibility), it will, when the land is no longer needed for airport purposes, dispose of such land at fair market value or make available to the Secretary an amount equal to the United

States' proportionate share of the fair market value of the land. That portion of the proceeds of such disposition which is proportionate to the United States' share of the cost of acquisition of such land will, upon application to the Secretary, be reinvested or transferred to another eligible airport as prescribed by the Secretary. The Secretary shall give preference to the following, in descending order:

1. Reinvestment in an approved noise compatibility project;
2. Reinvestment in an approved project that is eligible for grant funding under 49 USC § 47117(e);
3. Reinvestment in an approved airport development project that is eligible for grant funding under 49 USC §§ 47114, 47115, or 47117;
4. Transfer to an eligible sponsor of another public airport to be reinvested in an approved noise compatibility project at that airport; or
5. Payment to the Secretary for deposit in the Airport and Airway Trust Fund.

c. Land shall be considered to be needed for airport purposes under this assurance if (1) it may be needed for aeronautical purposes (including runway protection zones) or serve as noise buffer land, and (2) the revenue from interim uses of such land contributes to the financial self-sufficiency of the airport. Further, land purchased with a grant received by an airport operator or owner before December 31, 1987, will be considered to be needed for airport purposes if the Secretary or federal agency making such grant before December 31, 1987, was notified by the operator or owner of the uses of such land, did not object to such use, and the land continues to be used for that purpose, such use having commenced no later than December 15, 1989.

d. Disposition of such land under (a), (b), or (c) will be subject to the retention or reservation of any interest or right therein necessary to ensure that such land will only be used for purposes which are compatible with noise levels associated with operation of the airport.

32. Engineering and Design Services.

If any phase of such project has received federal funds under Chapter 471 subchapter 1 of Title 49 USC, it will award each contract, or sub-contract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering, surveying, mapping or related services in the same manner as a contract for architectural and engineering services is negotiated under Chapter 11 of Title 40 U S.C., or an equivalent qualifications-based requirement prescribed for or by the sponsor of the airport.

33. Foreign Market Restrictions.

It will not allow funds provided under this grant to be used to fund any project which uses any product or service of a foreign country during the period in which such foreign country is listed by the United States Trade Representative as denying fair and equitable market opportunities for products and suppliers of the United States in procurement and construction.

34. Policies, Standards, and Specifications.

It will carry out any project funded under an Airport Improvement Program Grant in accordance with policies, standards, and specifications approved by the Secretary including, but not limited to, current FAA Advisory Circulars (https://www.faa.gov/airports/aip/aip_pfc_checklist) for AIP projects as of January 16, 2026.

35. Relocation and Real Property Acquisition.

a. It will be guided in acquiring real property, to the greatest extent practicable under state law, by the land acquisition policies in Subpart B of 49 CFR Part 24 and will pay or reimburse property owners for necessary expenses as specified in Subpart B.

b. It will provide a relocation assistance program offering the services described in Subpart C of 49 CFR Part 24 and fair and reasonable relocation payments and assistance to displaced persons as required in Subpart D and E of 49 CFR Part 24.

c. It will make available within a reasonable period of time prior to displacement, comparable replacement dwellings to displaced persons in accordance with Subpart E of 49 CFR Part 24.

36. Access By Intercity Buses.

The airport owner or operator will permit, to the maximum extent practicable, intercity buses or other modes of transportation to have access to the airport; however, it has no obligation to fund special facilities for intercity buses or for other modes of transportation.

37. Disadvantaged Business Enterprises (DBE)/Airport Concessions Disadvantage Business Enterprise (ACDBE) Program.

The sponsor shall not discriminate on the basis of race, color, national origin, or sex, in the award and performance of any DOT-assisted contract covered by 49 CFR Part 26, or in the award and performance of any concession activity contract covered by 49 CFR Part 23. In addition, the sponsor shall not discriminate on the basis of race, color, national origin or sex in the administration of its Disadvantaged Business Enterprise (DBE) and Airport Concessions Disadvantaged Business Enterprise (ACDBE) programs or the requirements of 49 CFR Parts 23 and 26. The sponsor shall take all necessary and reasonable steps under 49 CFR Parts 23 and 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts, and/or concession contracts. The sponsor's DBE and ACDBE programs, as required by 49 CFR Parts 26 and 23, and as approved by DOT, are incorporated by reference in this agreement. Implementation of these programs is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the sponsor of its failure to carry out its approved program, the Department may impose sanctions as provided for under Parts 26 and 23 and may, in appropriate cases, refer the matter for enforcement under 18 USC § 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 USC §§ 3801-3809, 3812).

38. Hangar Construction.

If the airport owner or operator and a person who owns an aircraft agree that a hangar is to be constructed at the airport for the aircraft at the aircraft owner's expense, the airport owner or operator will grant to the aircraft owner for the hangar a long term lease that is subject to such terms and conditions on the hangar as the airport owner or operator may impose.

39. Competitive Access.

a. If the airport owner or operator of a medium or large hub airport (as defined in 49 USC § 47102) has been unable to accommodate one or more requests by an air carrier for access to gates or other facilities at that airport in order to allow the air carrier to provide service to the airport or to expand service at the airport, the airport owner or operator shall transmit a report to the Secretary that:

1. Describes the requests;

2. Provides an explanation as to why the requests could not be accommodated; and
3. Provides a time frame within which, if any, the airport will be able to accommodate the requests.

b. Such report shall be due on either February 1 or August 1 of each year if the airport has been unable to accommodate the request(s) in the six month period prior to the applicable due date.

40. Access to Leaded Aviation Gasoline

a. If 100-octane low lead aviation gasoline (100LL) was made available at an airport, at any time during calendar year 2022, an airport owner or operator may not restrict or prohibit the sale of, or self-fueling with, 100-octane low lead aviation gasoline.

b. This requirement remains until the earlier of December 31, 2030, or the date on which the airport or any retail fuel seller at the airport makes available an unleaded aviation gasoline that has been authorized for use by the FAA as a replacement for 100-octane low lead aviation gasoline for use in nearly all piston-engine aircraft and engine models; and meets either an industry consensus standard or other standard that facilitates the safe use, production, and distribution of such unleaded aviation gasoline, as determined appropriate by the FAA.

c. An airport owner or operator understands and agrees, that any violation of this grant assurance is subject to civil penalties as provided for in 49 USC § 46301(a)(8).

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Greg Pedroza, Director Aviation

SUBJECT: AN ORDINANCE APPROVING A T-HANGAR LEASE AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO HOME RULE MUNICIPAL CORPORATION, AND JASON PARKER FOR HANGAR UNIT H AT 31501 BRYAN CIRCLE AT PUEBLO MEMORIAL AIRPORT

SUMMARY:

Attached is an Ordinance approving a T-Hangar Lease Agreement between the City of Pueblo and Jason Parker for Hangar Unit H at 31501 Bryan Circle, located at the City's east-side T-hangar complex at Pueblo Memorial Airport. The Lease commences July 1, 2026, has an initial term of one year with up to four one-year renewal options, and provides monthly rent of $265.00 set by the Schedule of Rates and Charges adopted by City Council.

PREVIOUS COUNCIL ACTION:

None.

BACKGROUND:

The City of Pueblo owns and operates Pueblo Memorial Airport, including the T-hangar complex located on the east side of the airfield at 31501 Bryan Circle. Hangar Unit H at that complex is presently vacant. Mr. Parker has applied to lease Hangar Unit H for the storage of an aircraft.

The Lease has an initial term of one year commencing July 1, 2026, with four one-year renewal options exercisable by Mr. Parker on at least fifteen days' written notice. The aggregate term, including all renewals, is capped at five years. Either party may terminate the Lease on fourteen days' written notice. Mr. Parker is required to maintain commercial general liability insurance with limits of $1,000,000 per occurrence and $3,000,000 in the aggregate, naming the City as additional insured and loss payee. The

Premises are leased AS IS, and Mr. Parker assumes the risk of loss, damage, or injury with respect to the Aircraft and personal property kept at the Premises.

The Lease has been approved as to form by the City Attorney.

FINANCIAL IMPLICATIONS:

The City will receive $265.00 per month, or $3,180.00 over the initial one-year term, in rental revenue. The rate is set by the Schedule of Rates and Charges and is subject to Council adjustment at any time, with the adjusted rate applying to any subsequent renewal term elected by the Lessee. Over the maximum five-year aggregate term, total rental revenue at the rate in effect on the Effective Date is $15,900.00. Rent revenue is dedicated to airport purposes consistent with PMC § 3-1-7.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If this Ordinance is not approved, Hangar Unit B will remain vacant and the City will forgo the rental revenue described above.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. PARKER 2026 07 01 LEASE AGREEMENT

ORDINANCE NO.

AN ORDINANCE APPROVING A T-HANGAR LEASE AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO HOME RULE MUNICIPAL CORPORATION, AND JASON PARKER FOR HANGAR UNIT H AT 31501 BRYAN CIRCLE AT PUEBLO MEMORIAL AIRPORT

WHEREAS, the City of Pueblo owns and operates the Pueblo Memorial Airport ("Airport"), the City having authority under C.R.S. §§ 41-4-201 and 41-4-204 to acquire, establish, construct, own, control, lease, equip, improve, maintain, operate, and regulate the Airport, and to exact and require charges, fees, and tolls in connection therewith; and

WHEREAS, the City owns and manages the T-Hangar facility identified herein and desires to lease one such T-Hangar unit to Lessee for the storage of an aircraft, and Lessee desires to lease the same upon the terms and conditions set forth herein.

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The T-Hangar Lease Agreement ("Agreement") between the City of Pueblo, a Colorado home rule municipal corporation, and Jason Parker, dated July 1, 2026, a copy of which is attached hereto, having been approved as to form by the City Attorney, is hereby approved.

SECTION 2.

The Mayor is authorized to execute the Agreement in the name of the City, and the City Clerk is directed to affix the seal of the City thereto and attest same.

SECTION 3.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance and the attached Agreement to effectuate the policies and procedures described therein.

SECTION 4.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____

President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

CITY OF PUEBLO
DEPARTMENT OF AVIATION
T-HANGAR LEASE AGREEMENT

This T-Hangar Lease Agreement ("**Lease**") is entered into this 1st day of July 2026 ("**Effective Date**"), between the City of Pueblo, a Colorado home rule municipal corporation ("**City**"), and Jason Parker, whose address is 2207 Overton Road, Pueblo, CO 81008 ("**Lessee**").

RECITALS

WHEREAS, the City of Pueblo owns and operates the Pueblo Memorial Airport ("**Airport**"), the City having authority under C.R.S. §§ 41-4-201 and 41-4-204 to acquire, establish, construct, own, control, lease, equip, improve, maintain, operate, and regulate the Airport, and to exact and require charges, fees, and tolls in connection therewith; and

WHEREAS, the City owns and manages the T-Hangar facility identified herein and desires to lease one such T-Hangar unit to Lessee for the storage of an aircraft, and Lessee desires to lease the same upon the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the foregoing recitals and of the mutual promises, covenants, and conditions contained herein, the sufficiency of which is hereby acknowledged, City and Lessee agree as follows:

ARTICLE I. LEASED PREMISES

1. **PREMISES AND AIRCRAFT.** City leases to Lessee the T-Hangar unit located at the Airport and identified as 31501 Bryan Circle Unit H ("**Premises**"), for the sole purpose of storing one (1) aircraft bearing FAA registration number ("**N-number**") N789RF ("**Aircraft**"). The Aircraft shall be continuously registered with the Federal Aviation Administration ("**FAA**") throughout the term of this Lease. Lessee shall report any change in the Aircraft N-number to City in writing within fourteen (14) days of the change so that City may comply with applicable FAA reporting requirements.

2. **SUBJECT TO ENCUMBRANCES.** Lessee's tenancy is subject to all easements, rights of way, covenants, conditions, restrictions, reservations, and limitations of record, and to all applicable zoning and land use laws, ordinances, codes, and regulations, including all conditions, regulations, restrictions, and requirements imposed by the FAA governing the Premises and its use.

3. **ACCEPTANCE AS IS.** The Premises are leased "AS IS, WHERE IS, WITH ALL FAULTS." City makes no representation or warranty, express or implied, as to suitability, fitness for a particular purpose, title, zoning, physical or environmental condition, utilities, governmental approvals, or compliance of the Premises with any law or regulation. Lessee's taking of possession is conclusive evidence that Lessee accepts the Premises in their present condition.

ARTICLE II. TERM AND RENEWAL

4. INITIAL TERM. The initial term of this Lease shall be one (1) year, commencing on the Effective Date and ending at 11:59 p.m. on the day before the first anniversary of the Effective Date, unless earlier terminated as provided herein.

5. RENEWAL OPTIONS. Lessee shall have the option to renew this Lease for up to four (4) successive renewal terms of one (1) year each. To exercise a renewal option, Lessee shall provide written notice to the Director of Aviation no later than fifteen (15) days prior to the expiration of the initial term or renewal term then in effect. If Lessee fails to provide timely renewal notice, this Lease shall terminate at the expiration of the then-current term, and Lessee shall surrender possession in accordance with Section 46. Lessee's renewal option is contingent on Lessee not being in default of this Lease at the time of renewal notice and on Lessee having no uncured material breach during the initial term or any renewal term then in effect; the Director of Aviation shall determine in good faith whether this condition is satisfied. Renewal at the Rent then in effect under the Schedule of Rates and Charges shall not require further action by City Council, the parties having agreed to the renewal mechanism set forth in this Lease. In no event shall the aggregate term of this Lease, including the initial term and all renewal terms, exceed five (5) years.

6. EARLY TERMINATION. Either party may terminate this Lease, with or without cause, by providing the other party at least fourteen (14) days' prior written notice stating the date on which the Lease shall terminate.

ARTICLE III. RENT, TAXES, AND FEES

7. MONTHLY RENT. Lessee shall pay to City monthly rent in the amount established for the T-Hangar unit type comprising the Premises by the Schedule of Rates and Charges adopted by City Council, as the same may be amended from time to time ("**Rent**"). The Rent in effect on the Effective Date is two hundred sixty-five dollars ($265) per month. Rent is payable in advance without notice or demand on or before the tenth (10^{th}) day of each calendar month at the address designated by City. Rent includes all utilities furnished by City to the Premises. No utilities other than those furnished by City shall be provided or permitted at the Premises without the prior written approval of the Director of Aviation.

8. ADJUSTMENT OF RENT ON RENEWAL. The Rent shall remain fixed at the amount in effect on the Effective Date during the initial term and during any renewal term then in effect. If City Council adjusts the Rent applicable to the T-Hangar unit type comprising the Premises during the initial term or any renewal term, the adjusted Rent shall apply to any subsequent renewal term elected by Lessee under Section 5. City shall provide Lessee written notice of any adjustment to the Rent at least thirty (30) days before the expiration of the term in which the adjustment takes effect. The Rent shall not be subject to any automatic consumer price index escalation.

9. LATE CHARGE AND DEFAULT INTEREST. Rent not received by City on or before the tenth (10th) day of the month in which it is due shall be subject to a late charge of Twenty-Five Dollars ($25.00). Any Rent or other sum due under this Lease that remains unpaid thirty (30) days after the due date shall accrue interest at the rate of eight percent (8%) per annum,

calculated from the original due date until paid in full. Late charges and interest are in addition to, and not in lieu of, any other remedy available to City under this Lease or at law.

10. **TAXES AND POSSESSORY INTEREST.** Lessee shall promptly pay when due all taxes, fees, licenses, and other governmental charges assessed against or applicable to the Premises or Lessee's use thereof. Lessee acknowledges that Pueblo County assesses a possessory interest tax against lessees of municipal property and that such tax is the responsibility of Lessee. City is a tax-exempt entity and shall not be liable for any tax of Lessee. Lessee acknowledges that multiple taxes and costs are associated with owning and operating an aircraft, including the leasing of hangar space, and that all such taxes and costs shall be paid by Lessee whether or not Lessee was aware of them.

ARTICLE IV. USE OF PREMISES

11. **PERMITTED USE.** The Premises shall be used solely for the storage of the Aircraft and for the following incidental, non-commercial uses associated with such storage: (i) storage of aircraft parts, tools, and supplies belonging to Lessee and directly associated with the Aircraft; (ii) storage of one (1) operable personal vehicle owned by Lessee while Lessee is operating the Aircraft away from the Airport; (iii) preventive maintenance performed on the Aircraft by Lessee personally, to the extent authorized by 14 C.F.R. Part 43, Appendix A, paragraph (c); and (iv) such other incidental uses as the Director of Aviation may approve in writing. All other uses are prohibited.

12. **AERONAUTICAL USE REQUIRED.** All uses of the Premises shall be substantially aeronautical in nature. The Premises shall not be used for residential purposes, for any commercial operation, or for the storage of non-aeronautical personal property. The Premises shall not be used for the storage of automobiles, except as authorized by Section 11 herein. Failure to comply with this Section is a material breach of this Lease.

13. **MAINTENANCE BY OTHERS.** No person other than Lessee or a regular employee of Lessee may perform services on the Aircraft on the Premises beyond preventive maintenance as defined in 14 C.F.R. Part 43, Appendix A, paragraph (c). Any maintenance exceeding preventive maintenance shall be performed only by an authorized person at a location approved for such activity by the Director of Aviation.

14. **OPERATIONAL RESTRICTIONS.** Lessee shall comply with the following operational requirements: (i) hangar doors shall remain closed and locked except when the Premises are attended by Lessee; (ii) drive-through gates entering the Air Operations Area shall be kept closed and locked at all times except for ingress and egress; (iii) only automobiles belonging to owners of aircraft hangared on the Airport shall be permitted in the Air Operations Area; (iv) automobiles shall be parked in designated parking spaces or within the hangar; (v) no person or automobile shall go beyond the immediate vicinity of the Premises without the prior written consent of the Director of Aviation; (vi) Lessee shall provide drip pans of non-flammable material under the Aircraft to prevent damage to the floor; and (vii) mounting, hanging, suspending, or otherwise installing any item from the ceiling, support beams, or roofing structure of the hangar is prohibited.

15. **PROHIBITED MATERIALS.** No flammable liquids or hazardous materials shall be used or stored on the Premises, except for fuel contained in the Aircraft fuel tanks or in the tank of a properly parked stored automobile.

16. **LESSEE MAINTENANCE.** Lessee shall, at its own expense, keep the Premises neat, clean, safe, and orderly at all times, free of waste, rubbish, and debris, and shall provide for the sanitary handling and disposal of all trash, garbage, and refuse resulting from Lessee's activities at the Airport. No outside storage of parts, materials, equipment, inventory, or other property is permitted. Lessee is responsible for snow removal within five (5) feet of the hangar door.

ARTICLE V. INSURANCE; INDEMNIFICATION; RISK OF LOSS

17. **REQUIRED INSURANCE.** Lessee, at its sole cost and expense, shall procure and maintain in full force during the term of this Lease a policy of commercial general liability insurance with limits of not less than One Million Dollars ($1,000,000.00) per occurrence and Three Million Dollars ($3,000,000.00) in the aggregate. Coverage shall include, without limitation, legal liability for property damage, bodily injuries, and deaths of persons in connection with the operation, maintenance, or use of the Premises, including acts or omissions of Lessee. The policy shall name the City of Pueblo as an additional insured and loss payee. The policy shall provide that it cannot be canceled or materially altered by the insured or the insurance company unless thirty (30) days' prior written notice is given to City. Lessee shall furnish a certificate of insurance evidencing such coverage upon execution of this Lease and upon issuance or renewal of any such policy thereafter. Lessee shall notify the Director of Aviation in writing of any change, expiration, or non-renewal within two (2) weeks of such event.

18. **INDEMNIFICATION.** Lessee shall indemnify, defend, and hold harmless City and its officers, agents, representatives, and employees from and against any and all penalties, liability, or loss, including costs and reasonable attorney fees, resulting from claims or court action, whether civil, criminal, or in equity, arising directly or indirectly from: (i) the acts or omissions of Lessee, its agents, employees, contractors, or guests; (ii) any occurrence in, on, or about the Premises; (iii) any condition of the Premises or any equipment, appurtenance, or activity thereon; or (iv) any injury or damage caused or occasioned in connection with Lessee's use or occupancy of the Premises. Nothing in this Lease is intended to waive, limit, or otherwise affect any immunity or limitation of liability conferred upon City under federal or state law, including the Colorado Governmental Immunity Act, C.R.S. § 24-10-101 et seq., as amended.

19. **RISK OF LOSS.** Lessee assumes all risk of loss, damage, injury, and liability with respect to Lessee, Lessee's guests, the Aircraft, Lessee's improvements, and Lessee's personal property in or upon the Premises. City shall not be liable or responsible for any such loss, damage, or injury, regardless of cause, including the negligence of City, its officers, agents, or employees. Lessee shall not hold or attempt to hold City liable for any injury, including loss of life, to any person or for damage to any property while on the Premises or the Airport, irrespective of how such injury or damage may be caused or occasioned.

ARTICLE VI. RIGHTS AND PRIVILEGES OF LESSEE

20. EXCLUSIVE USE. Subject to the rights reserved to City herein, Lessee shall have the exclusive use of the Premises for the purpose of storing the Aircraft and for the incidental uses set forth in Section 11. Lessee shall not assign this Lease or sublet the Premises or any part thereof.

21. IMPROVEMENTS AND ALTERATIONS. Except as specifically authorized herein, Lessee shall not, without the prior written approval of the Director of Aviation, make improvements, modifications, revisions, signs, or other alterations to the Premises. All improvements, modifications, revisions, signs, and alterations shall be at Lessee's sole expense and shall be performed by trade professionals licensed, insured, and permitted to conduct business within the City of Pueblo. Upon expiration or termination of this Lease, Lessee shall remove all such improvements at no cost to City; provided, however, that City may, on a case-by-case basis, allow improvements to remain, in which case City shall not be liable to Lessee for the cost thereof.

22. NO ENCUMBRANCE. Lessee shall not, directly or indirectly, voluntarily or involuntarily, mortgage, pledge, hypothecate, or otherwise encumber, or permit to be encumbered, the Premises, the leasehold interest created by this Lease, or any portion thereof or interest therein, by deed of trust, mortgage, lien, security interest, or other encumbrance of any kind. Any encumbrance recorded or asserted in violation of this Section shall be void as against City and shall constitute a material default of this Lease. Lessee shall, at Lessee's sole cost and expense, take all action necessary to remove and release any such encumbrance within ten (10) days of written notice from City. City shall have no obligation to subordinate its fee interest in the Airport to any encumbrance asserted against the leasehold. City's mechanic's lien rights under the laws of the State of Colorado are unaffected by this Section.

23. INGRESS AND EGRESS. Lessee, its employees, and invitees shall have the right of ingress and egress between designated airport access points and the Premises over, upon, and through such streets and not others as may be designated by the Director of Aviation from time to time. Driveways from existing streets into the Premises shall be located as designated by the Director of Aviation.

ARTICLE VII. RIGHTS AND PRIVILEGES OF CITY

24. RESERVED RIGHTS. All rights not herein granted to Lessee are reserved to City.

25. RIGHT OF ENTRY AND INSPECTION. City shall have the full and unrestricted right to enter upon those portions of the Airport occupied by Lessee, and City, its agents, or representatives shall be permitted to inspect the Premises during regular business hours or upon twenty-four (24) hours' notice to Lessee. In the event of an emergency, City may enter the Premises without prior notice. Lessee shall not inhibit, obstruct, delay, or refuse to allow City's entry or inspection authorized under this Section, and any such inhibition, obstruction, delay, or refusal shall constitute a material default of this Lease and grounds for immediate termination under Article X.

26. **MAINTENANCE OF AIRPORT FACILITIES.** City reserves the right, but not the obligation, to maintain and keep in repair the landing areas of the Airport and all publicly owned facilities of the Airport. City shall not be obligated to Lessee for any failure to maintain or repair such areas or facilities.

27. **Construction and Operational Restrictions.** Lessee acknowledges that the Airport is a public-use facility, the operation of which may from time to time require the temporary restriction of Lessee's access to the Premises or otherwise inconvenience or interrupt Lessee's operations at the Airport. Such circumstances include, without limitation: (i) programs of construction, reconstruction, expansion, relocation, maintenance, and repair at and to the Airport undertaken by City to ensure that the Airport and its facilities are suitable for the volume and character of air traffic and flight activity; (ii) airshows and other aerial demonstrations conducted at or in the vicinity of the Airport; (iii) flight restrictions imposed by the Federal Aviation Administration in the proximity of the President, Vice President, or other federally protected parties; (iv) temporary flight restrictions over disaster or hazard areas; (v) military operations conducted at or in the vicinity of the Airport; and (vi) emergency response, public safety, or security operations. City shall provide Lessee with reasonable advance notice of any such restriction or activity when feasible, except where notice is impracticable, prohibited by federal authority, or would compromise the operation. Lessee waives any claim against City or its officers, agents, employees, contractors, subcontractors, and representatives for damages, rent abatement, or other consideration arising from any such restriction, inconvenience, or interruption, and Lessee's obligations under this Lease, including the obligation to pay Rent, shall continue without interruption.

28. **RESERVATION OF AIRSPACE.** There is hereby reserved to City, its successors, and assigns, for the use and benefit of the public, a right of flight for the passage of aircraft in the airspace above the surface of the Premises, together with the right to cause in such airspace such noise as may be inherent in the operation of aircraft, now known or hereafter used, for navigation of or flight in the air, using such airspace or landing at, taking off from, or operating at the Airport.

29. **RIGHT TO DEVELOP.** City reserves the right, without any obligation to do so, to develop, modify, change, improve, or abandon the Airport or any part thereof as City may determine in its sole discretion, at any time, regardless of the desires or views of Lessee, and without interference or hindrance from Lessee or liability to Lessee.

30. **CITY MAINTENANCE OBLIGATION.** City shall maintain the floor, walls, roof, and doors of the Premises, except that the cost of repair for any damage to the same caused by Lessee, its employees, agents, or invitees shall be borne solely by Lessee.

31. **NO LIABILITY FOR LESSEE PROPERTY.** All risk of loss or damage to the Aircraft and to other personal property of Lessee in or upon the Premises is assumed by Lessee. City shall not be liable or responsible for any loss or damage to such property regardless of cause, including the negligence of City, its officers, agents, or employees.

ARTICLE VIII. FAA AND FEDERAL COMPLIANCE

32. SUBORDINATION TO FEDERAL AGREEMENTS. This Lease and all the provisions hereof are subject to all rights the United States Government now has or may in the future have or acquire affecting the control, operation, regulation, re-entry upon, and taking over of the Airport, including the Premises.

33. NO EXCLUSIVE RIGHTS. Nothing herein shall be construed to grant or authorize the granting of an exclusive right within the meaning of 49 U.S.C. § 40103(e).

34. TITLE VI COVENANT. Lessee, for itself, its heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree, as a covenant running with the land, that: (i) no person on the grounds of race, color, or national origin shall be excluded from participation in, denied the benefits of, or otherwise subjected to discrimination in the use of the Premises; (ii) in the construction of any improvements on, over, or under the Premises and the furnishing of services thereon, no person on the grounds of race, color, or national origin shall be excluded from participation in, denied the benefits of, or otherwise subjected to discrimination; and (iii) Lessee shall use the Premises in compliance with all other requirements imposed by or pursuant to 49 C.F.R. Part 21, Nondiscrimination in Federally-Assisted Programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964, as said Regulations may be amended.

35. CONSTRUCTION AND USE OF FACILITIES. Lessee, as a part of the consideration hereof, does hereby covenant and agree, as a covenant running with the land, that in the event facilities are constructed, maintained, or otherwise operated on the Premises for a purpose for which a United States Department of Transportation program or activity is extended or for another purpose involving the provision of similar services or benefits, Lessee shall maintain and operate such facilities and services in compliance with all requirements imposed pursuant to 49 C.F.R. Part 21, as said Regulations may be amended.

36. GENERAL CIVIL RIGHTS COMPLIANCE. In all activities within the scope of the airport program, Lessee agrees to comply with pertinent statutes, Executive Orders, and rules identified in the Title VI List of Pertinent Nondiscrimination Acts and Authorities, as referenced in Section 37, to ensure that no person shall, on the grounds of race, color, national origin (including limited English proficiency), creed, sex (including sexual orientation and gender identity), age, or disability, be excluded from participating in any activity conducted with or benefiting from federal assistance. This Section is in addition to, and not in lieu of, the covenants set forth in Sections 34 and 35.

37. PERTINENT NONDISCRIMINATION AUTHORITIES.

During the performance of this Lease, Lessee, for itself, its assignees, and successors in interest, agrees to comply with the following nondiscrimination statutes and authorities, including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq.) (prohibits discrimination on the basis of race, color, or national origin);

- 49 C.F.R. Part 21 (Nondiscrimination in Federally-Assisted Programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964);
- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 et seq.), as amended (prohibits discrimination on the basis of disability), and 49 C.F.R. Part 27;
- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 et seq.) (prohibits discrimination on the basis of age);
- Titles II and III of the Americans with Disabilities Act of 1990 (42 U.S.C. §§ 12131–12189), as implemented by 49 C.F.R. Parts 37 and 38;
- 49 U.S.C. § 47123 (FAA nondiscrimination provision); and
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency.

ARTICLE IX. ENVIRONMENTAL PROVISIONS

38. HAZARDOUS MATERIALS DEFINED. For purposes of this Lease, "Hazardous Materials" means any hazardous or toxic substance, material, or waste regulated by any local government authority, the State of Colorado, or the United States government, including without limitation: (i) substances defined as "hazardous waste," "restricted hazardous waste," "hazardous substance," or "hazardous material" under any applicable federal, state, or local law or regulation ("Environmental Regulations"); (ii) asbestos-containing materials; (iii) PCBs; (iv) petroleum or petroleum-based products; and (v) lead.

39. ENVIRONMENTAL COMPLIANCE. Lessee shall comply with all Environmental Regulations applicable to Lessee and its use of the Premises. No activity shall be undertaken by Lessee, its guests, employees, agents, contractors, or subcontractors on, or any portion of, the Premises that would cause or permit: (i) the presence, use, generation, release, discharge, storage, or disposal of any Hazardous Material in, on, under, about, or from the Premises in violation of any Environmental Regulation; (ii) any portion of the Premises to become a hazardous waste treatment, storage, or disposal facility without proper governmental authorization and compliance with all Environmental Regulations; or (iii) the discharge of pollutants or effluents into any water source or system, or the discharge into the air of any emissions, without proper governmental authorization and compliance with all Environmental Regulations, including the Federal Water Pollution Control Act, 33 U.S.C. § 1251 et seq., and the Clean Air Act, 42 U.S.C. § 7401 et seq.

40. ENVIRONMENTAL INDEMNITY. Lessee shall defend, indemnify, and forever hold harmless City and its officers, employees, agents, successors, and assigns from all claims, losses, damages, penalties, expenses, and costs, including reasonable attorney fees, characterization, remediation, and cleanup costs, incurred by reason of the use, storage, generation, release, discharge, maintenance, disposal, or removal of Hazardous Materials in, on, under, about, or from the Premises by Lessee, its employees, agents, guests, contractors, or subcontractors.

ARTICLE X. DEFAULT, REMEDIES, AND TERMINATION

41. **EVENTS OF DEFAULT.** Each of the following constitutes an event of default under this Lease: (i) failure of Lessee to pay any Rent, fee, or other sum due under this Lease when due; (ii) failure of Lessee to perform any other obligation under this Lease; (iii) violation by Lessee of any airport security rule, now or hereafter in effect; (iv) the declaration of insolvency or bankruptcy of Lessee, the assignment of Lessee's property for the benefit of creditors, the levy upon or seizure of Lessee's leasehold interest by writ of any court of law, or the appointment of a Trustee in Bankruptcy or Receiver for the property of Lessee; (v) abandonment of the Premises; (vi) inhibition, obstruction, delay, or refusal by Lessee of City's entry or inspection authorized under Section 25; (vii) assignment of this Lease in violation of Section 20; (viii) subletting of the Premises in violation of Section 20; or (ix) any encumbrance of the Premises or the leasehold interest in violation of Section 22.

42. **TERMINATION ON DEFAULT.** Upon the occurrence of an event of default in payment, or any breach of the covenants or agreements herein, City may declare this Lease terminated, and after the expiration of fourteen (14) days from the date of service of a written notice of termination, City shall be entitled to possession of the Premises. Upon the occurrence of an event of default related to insolvency or bankruptcy under Section 41(iv), City may, at its option, immediately terminate this Lease and retake possession of the Premises with or without notice, notice being expressly waived, without working any forfeiture of any accrued obligations of Lessee. Violation of airport security rules, interference with City's right of entry or inspection under Section 25, or any breach of Section 20 (assignment or subletting) or Section 22 (encumbrance), shall be grounds for immediate termination of this Lease.

43. **REMEDIES ON DEFAULT.** If, after notice of termination as provided herein, Lessee shall refuse to surrender and deliver possession of the Premises, City may, without further notice or demand, enter upon and take possession of the Premises, expel and remove Lessee, using such help, assistance, and force as may be needful and proper, without prejudice to any remedy allowed by law. If the Premises are left vacant and any Rent reserved remains unpaid, City may, without obligation to do so and without terminating this Lease, retake possession of the Premises and re-let the same for such rent and upon such conditions as City deems best, making such changes and repairs as may be required, giving credit for the amount of rent so received less all expenses of such changes and repairs, and Lessee shall be liable for the balance of the Rent reserved until the expiration of this Lease.

44. **CITY'S LIEN.** In the event this Lease is terminated as herein provided, City shall have, and Lessee hereby grants, a lien upon Lessee's equipment, fixtures, furniture, and inventory in or upon the Premises for all Rent, expenses, attorney fees, and costs then due or to become payable by Lessee. Such lien may be enforced by the taking and sale of such property in the manner provided for the disposition of collateral under the Colorado Uniform Commercial Code.

45. **HOLDOVER.** If, after the expiration of the term of this Lease, Lessee remains in possession of the Premises and continues to pay Rent without any express written agreement as to such holding over, Lessee shall be a month-to-month tenant subject to all terms and covenants of

this Lease, except that during the term of any month-to-month tenancy, City or Lessee may terminate this Lease upon fourteen (14) days' prior written notice.

46. SURRENDER OF PREMISES. Without affecting any other right granted to City under this Lease, Lessee shall remove the Aircraft and any personal property from the Premises within seven (7) days after termination of this Lease. Should Lessee fail to remove such property within that seven-day period, City shall have the right to enter and remove the property, and Lessee shall be liable for all costs of removal. Unclaimed property shall be deemed abandoned and may be disposed of in any manner City deems appropriate. Should City sell the abandoned property, the proceeds shall first be applied to costs due to City, and any remaining amount shall be forwarded to Lessee.

47. ATTORNEY FEES. Lessee shall pay City all costs, including reasonable attorney fees, incurred by City in recovering any Rent or other money due and unpaid or in recovering possession of the Premises after termination of this Lease.

ARTICLE XI. NOTICES

48. NOTICE REQUIREMENTS. Any notice, demand, or request provided in this Lease shall be in writing and given by either: (i) certified mail, return receipt requested, to the address of the receiving party as follows:

To City:	To Lessee:
Director of Aviation 31201 Bryan Circle Pueblo, CO 81001	Jason Parker 2207 Overton Road Pueblo, CO 81008 JPARKER1006@HOTMAIL.COM

or, (ii) electronic mail, transmitted to the email address designated by the receiving party with a copy concurrently sent by certified mail, return receipt requested. Notice shall be deemed given on the date of mailing for certified mail, or, if delivered by electronic mail, on the date of confirmed transmission, provided that the required certified mail copy is also sent on or before the next business day.

ARTICLE XII. GENERAL CONDITIONS

49. SUBORDINATION TO CODE, RULES, AND REGULATIONS. The terms and conditions of this Lease and Lessee's rights hereunder are subject to the provisions of the Pueblo Municipal Code ("**PMC**"), as the same may be subsequently amended, including without limitation Title III thereof relating to the Department of Aviation, and to the Airport Rules and Regulations adopted by the Director of Aviation, as amended from time to time. In the event of conflict between the PMC and this Lease, the PMC shall control. Lessee shall observe faithfully all rules and regulations affecting use of the Airport, whether established by the Director of Aviation, the City, or other political subdivision having jurisdiction, the State of Colorado, or the United States, or agencies thereof, including rules affecting the operation of motor vehicles upon, to, and from the Airport. Lessee, and all officers, agents, and employees of

Lessee, agree to be bound by and subject to all police ordinances of the City of Pueblo at all times while on the Airport.

50. **Non-Interference with Aircraft Operations.** Lessee, by accepting this Lease, expressly agrees for itself, its successors, and assigns that it shall not make use of the Premises in any manner that might interfere with the landing and taking off of aircraft from the Airport or otherwise constitute a hazard. In the event the foregoing covenant is breached, City reserves the right to enter upon the Premises and cause the abatement of such interference at the expense of Lessee.

51. **Governing Law and Venue.** This Lease shall be governed by and construed in accordance with the laws of the State of Colorado. Venue for any action arising under or for the enforcement of this Lease shall lie exclusively in a state court of competent jurisdiction located in Pueblo County, Colorado.

52. **No Third-Party Beneficiaries.** Nothing in this Lease is intended, nor shall it be construed, to create any rights, claims, or benefits in any third party, or to assume any liability for or on behalf of any third party, or to waive any immunities or limitations conferred upon City under federal or state law, including the Colorado Governmental Immunity Act, C.R.S. § 24-10-101 et seq.

53. **No Partnership or Joint Venture.** Nothing in this Lease is intended to, nor shall be deemed to, constitute a partnership or joint venture between the parties, or to create any agency or partner relationship between the parties. Neither party shall hold itself out as a partner, joint venturer, agent, or representative of the other under this Lease.

54. **Successors and Assigns.** All covenants and agreements in this Lease shall be binding upon and inure to the benefit of the heirs, successors, assigns, and legal representatives of City and Lessee, subject to the restrictions on assignment and subletting set forth herein.

55. **Severability.** If any provision of this Lease is held by a court of competent jurisdiction to be invalid, illegal, or unenforceable, the remainder of this Lease shall remain in full force and effect, and the invalid, illegal, or unenforceable provision shall be deemed modified to the minimum extent necessary to render it enforceable while preserving the intent of the parties to the maximum extent possible.

56. **Integration.** This Lease constitutes the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior negotiations, representations, and agreements, whether written or oral. This Lease may be amended only by a written instrument signed by both parties and approved by City Council where such approval is required by law.

57. **No Waiver.** No assent, express or implied, to any breach of any covenant or agreement of this Lease shall be deemed or taken to be a waiver of any succeeding or other breach. No failure or delay by City in exercising any right under this Lease shall operate as a waiver of such right.

58. **Captions.** The captions and headings used in this Lease are for convenience of reference only and shall not be used to construe or interpret any provision of this Lease.

59. **COUNTERPARTS AND ELECTRONIC EXECUTION.** This Lease may be executed in counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument. The parties may execute this Lease by electronic signature, and any such electronic signature shall be deemed an original signature for all purposes.

60. **SURVIVAL.** All obligations of Lessee that by their nature are intended to survive termination of this Lease, including without limitation the indemnity obligations under Sections 18 and 40, the environmental obligations under Article IX, the surrender obligations under Section 46, and the attorney fee obligation under Section 47, shall survive termination of this Lease.

Executed at Pueblo, Colorado, the day and year first above written.

LESSEE:

_____

Jason Parker

CITY:

City of Pueblo, A Municipal Corporation

By: _____

Mayor

ATTEST:

By: _____

City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Greg Pedroza, Director Aviation

SUBJECT: AN ORDINANCE APPROVING A SECOND AMENDMENT TO LEASE IMPROVED PROPERTY FOR THE USE OF LAND AT THE PUEBLO MEMORIAL AIRPORT BETWEEN THE CITY OF PUEBLO, A COLORADO HOME RULE MUNICIPAL CORPORATION, AND THE STATE OF COLORADO DEPARTMENT OF PUBLIC SAFETY, DIVISION OF FIRE PREVENTION AND CONTROL, AND AUTHORIZING THE MAYOR TO EXECUTE THE SAME.

SUMMARY:

The State of Colorado Department of Public Safety, Division of Fire Prevention and Control, ("State") is desirous of extending their lease and adding an additional one thousand eight hundred (1,800) square feet of land for the use of a pumping station to prevent storm water contamination from potential illicit discharge of fire retardant.

PREVIOUS COUNCIL ACTION:

City Council approved the Lease Agreement through Ordinance 10243 on August 8, 2022, and the First Amendment to Lease on October 23, 2023, through Ordinance 10578.

BACKGROUND:

The State has been leasing office space and the Base at the Pueblo Memorial Airport since 2022. On September 13, 2023, an illicit discharge of fire retardant that reached the City of Pueblo Stormwater system prompted a notice of violation and corrective action by the State. As a result, the State installed a pumping system into the drainage catch basin to pump any discharge of fire retardant into a containment tank to prevent it from entering the stormwater system. The State provided the infrastructure and the pumping mechanisms, and the City provided approximately one thousand eight hundred (1800) square feet for installation and additional room for spatial barrier.

FINANCIAL IMPLICATIONS:

None.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If City Council does not approve this Ordinance, the additional space will not be added to the leasehold.

RECOMMENDATION:

The Department of Aviation recommends approval of this Ordinance.

ATTACHMENTS:

1. CDFPC 2026 07 01 SECOND AMENDMENT & LEASE OPTION TO EXTEND

ORDINANCE NO.

AN ORDINANCE APPROVING A SECOND AMENDMENT TO LEASE IMPROVED PROPERTY FOR THE USE OF LAND AT THE PUEBLO MEMORIAL AIRPORT BETWEEN THE CITY OF PUEBLO, A COLORADO HOME RULE MUNICIPAL CORPORATION, AND THE STATE OF COLORADO DEPARTMENT OF PUBLIC SAFETY, DIVISION OF FIRE PREVENTION AND CONTROL, AND AUTHORIZING THE MAYOR TO EXECUTE THE SAME.

WHEREAS, the City of Pueblo is the owner and operator of the Pueblo Memorial Airport together with the land on which said Airport is situated; and

WHEREAS, the State of Colorado Department of Public Safety, Division of Fire Prevention and Control, is desirous of leasing one thousand eight hundred (1800) square feet of land for a fire retardant containment tank and infrastructure; NOW THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The Second Amendment to Lease Improved Real Property ("Lease"), by and between the City of Pueblo, a Municipal Corporation, and the State of Colorado Department of Public Safety, Division of Fire Prevention and Control, a copy of which is attached hereto and made a part hereof by reference, after having been approved as to form by the City Attorney, is hereby approved.

SECTION 2.

The Mayor is hereby authorized to execute the Lease in the name and on behalf of the City of Pueblo, where the Mayor may execute the Lease by electronic signature and such electronic signature shall be attributable to the Mayor and the City of Pueblo.

SECTION 3.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance and the attached Lease to effectuate the terms and conditions described therein.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____
_____
_____
_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

State of Colorado

Department of Personnel and Administration

Office of the State Architect

Real Estate Programs

Cover Page

Lease Amendment - Improved Real Property

Landlord:	**City of Pueblo, a Municipal Corporation**
Tenant:	**The State of Colorado acting by and through the Department of Public Safety for the use and benefit of the Division of Fire Prevention and Control**
Location:	**31501 Bryan Circle, Suites 110 & 120, Pueblo Colorado 81001 ("Office"), 31851 Walt Bassett Avenue, Pueblo, Colorado 81001 ("Base"), and 524 Cherokee Lane, Pueblo, Colorado 81001 ("New Space")**

Signature Page

IN WITNESS WHEREOF, the parties hereto have executed this **Agreement**.

Lessor/Landlord:

City of Pueblo, a Municipal Corporation

By: _____
Authorized Signatory

Name:

Title: Mayor

Date:

ATTEST:
By: _____
City Clerk, City of Pueblo (Affix City Seal)

Office of the State Architect (OSA)
Real Estate Manager (or authorized Delegate)

By: _____
Date:

State Office of Risk Management (if needed, as determined by OSA or OSC)
State Risk Manager (or authorized Delegate)

By: **N/A**_____
Date:

Legal Review (if needed, as determined by OSA or OSC)
Philip J. Weiser, Attorney General
Attorney General (or authorized Delegate)

By: N/A_____
Date:

Lessee/Tenant:

STATE OF COLORADO
Jared S. Polis, Governor
The Department of **Public Safety**

By: _____

Name:

Title:

Date:

All contracts must be approved by the State Controller:
C.R.S. § 24-30-202 requires that the State Controller approve all State contracts. This contract is not valid until the State Controller, or such assistant as he may delegate, has signed it. The Landlord is not authorized to begin performance until the contract is signed and dated below. If performance begins prior to the date below, the State of Colorado may not be obligated to pay for the good and/or services provided.

Office of the State Controller
Robert Jaros, State Controller
State Controller (or authorized Delegate)

By: _____

Effective Date: _____

Second Amendment To Lease

Improved Real Property

THIS **SECOND Amendment To Lease** ("Amendment"), for the purpose of amending that certain lease dated **August 17, 2022, and amended by the First Amendment to Lease dated November 1, 2023,** (the "Lease"), by and between **City of Pueblo, a Municipal Corporation**, whose address or principal place of business is **1 City Hall Place, Pueblo, CO 81003**, hereinafter referred to as "Landlord", and THE STATE OF COLORADO (the "State"), acting by and through the **Department of Public Safety for the use and benefit of the Division of Fire Prevention and Control** whose address is **1697 Cole Blvd, Suite 200, Lakewood, CO 80401**, hereinafter referred to as "Tenant". Both Landlord and Tenant may be referred to individually as a "Party", and shall collectively hereinafter be referred to as "Parties" to this Amendment.

Relating to the leased portion(s) of the building(s) **and land** located at **31501 Bryan Circle, Suites 110 & 120 ("Office"), 31851 Walt Bassett Avenue ("Base"), and 524 Cherokee Lane ("New Space")**, ~~hereinafter referred to as "Building",~~ in Pueblo County, Colorado, comprised of approximately

A. 524 Cherokee Lane consisting of approximately eight hundred and ninety-three (893) rentable square feet **of Office Space, Storage space in the Hangar for forklift and generator stowage, landside paved parking lot and dirt overflow parking lot; 0.51 total acreage as defined in Exhibit A1;**

B. 31501 Bryan Circle, Suite 110, consisting of approximately three hundred and fourteen (314) rentable square feet, and Suite 120 consisting of approximately six hundred and fifteen (615) rentable square feet;

C. 31851 Walt Bassett Ave, consisting of approximately thirty thousand (30,000) rentable square feet of the Base including the pumping station and approximately twenty-one thousand (21,000) rentable square feet of exclusive use parking apron for aircraft.

Exhibit A1 - 524 Cherokee Lane
Exhibit A2 - 31501 Bryan Circle, Suite 110 and 120
Exhibit A3 - 31851 Walt Bassett Ave

WHEREAS, Authority to enter into this Lease exists under Colorado Revised Statute (C.R.S.) § 24-1-136.5(7) and funds have been budgeted, appropriated and otherwise made available and a sufficient unencumbered balance thereof remains available for payment. Required approvals, clearance and coordination have been accomplished from and with appropriate agencies.

WHEREAS, **by this Second Amendment to Lease, the Parties agree to amend the Lease to: 1) at no extra cost to Tenant, add approximately one thousand eight hundred (1,800) square feet (30' x 60') to the Premises to include the discharge containment tank and electrical (see Exhibit A4); 2) extend the term of the Lease commencing on July 01, 2026, through June 30,**

2027; 3) stipulate the Monthly Rent for the extended term; and 4) otherwise amend and clarify the Lease; and

WHEREAS, proceeding Option Letter 3 executed May 29, 2025; proceeding Option Letter 2 executed April 17, 2024; proceeding Option Letter 1 executed April 28, 2023; and

WHEREAS, the Tenant is paying 100% of the monthly rental amounts due; and

WHEREAS, the Lease, the First Amendment to Lease, and this Second Amendment to Lease are hereinafter collectively referred to as the "Lease"; and

WHEREAS, this Second Amendment has been approved by the City of Pueblo, as Landlord, as a minor amendment under Section 1-5-2(2)(f) of the Pueblo Municipal Code, which authorizes the Mayor to agree to minor amendments to contracts previously approved by City Council; and

NOW, THEREFORE, Landlord and Tenant in consideration of the mutual promises contained herein, hereto agree to amend the Lease as follows:

1. **Term, Rent.**

   A. TO HAVE AND TO HOLD the same, together with all appurtenances, unto Tenant, for the term beginning the later of **July 01,2026**, and ending **June 30, 2027**, at and for a monthly rental (the "Monthly Rent") for the term as shown below:

   B. RENT. **31,822** sq. ft.

Term Dates (by Fiscal Year)	Monthly Rent	Annual Fiscal Term Rent
07/01/2026-06/30/2027	**$1,130**	**$13,560**

   C. For informational purposes and historical reference, the previous rent table(s) are shown in Schedule A.

   D. ~~§ 39-3-124 C.R.S. exempts real property leased by the State of Colorado from the levy and collection of property taxes. Therefore, the Adjusted Annual Rent/RSF as shown above does not include the **[Insert County]** County Property Taxes known at the time of drafting to be **$[Insert Real Estate Property TAX]**/RSF, or any tax based upon real property as defined and required by Article 2; when the current year Taxes are known, the Monthly Rent payment shall be adjusted accordingly. The Property Tax is estimated as known at the time of~~

~~drafting this document. The Parties agree to regular reconciliation of property tax exemptions.~~ **Landlord is tax exempt.**

2. Order of Precedence. The provisions of the Lease shall govern the relationship of the State and Landlord. In the event of conflicts or inconsistencies between the Lease and the FIRST and SECOND Amendment such conflicts or inconsistencies shall be resolved by reference to the documents in the following order of priority:

    i. The provisions of the **SECOND** Amendment to Lease,
    ii. The provisions of the FIRST Amendment to Lease
    iii. The provisions of the main body of the Lease.

3. Except as modified by the provisions of this **SECOND** Amendment to Lease, all other terms and conditions in the Lease are hereby ratified and confirmed and remain in full force and effect.

4. The effective date of this **SECOND** Amendment to Lease shall not be prior to the date signed by the State Controller or his designee. In accordance with the requirements of C.R.S § 24-30-202 (1), as amended, this Amendment shall not be deemed valid until it has been approved by the State Controller, or such assistant as he may designate.

End of Main Body of Contract.

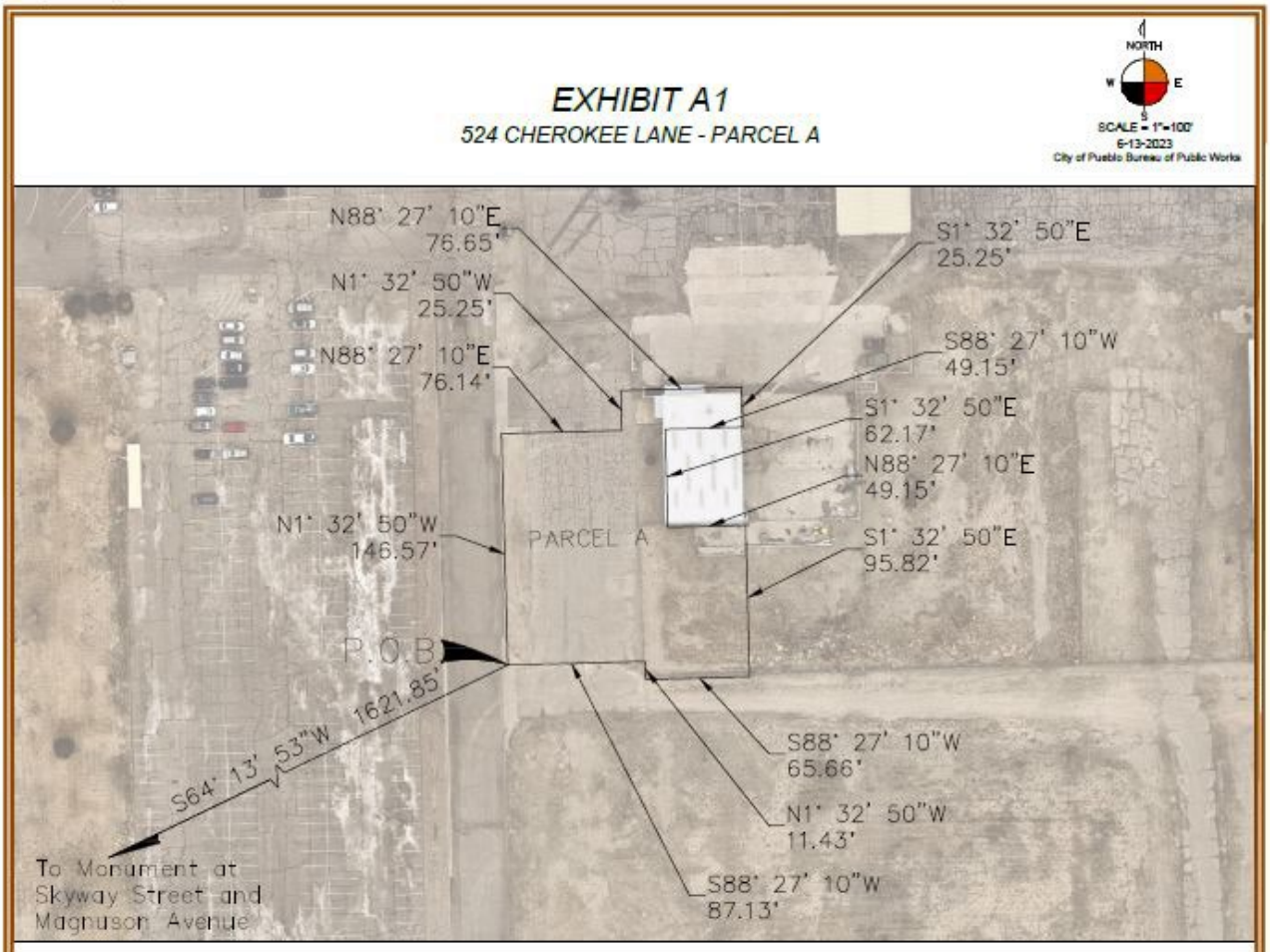
Schedule A

For informational purposes and historical reference, the previous rent table(s) are shown below:

Term Dates (by Fiscal Year)	Monthly Rent	Annual Fiscal Term Rent
Commencement Date - 06/30/2024	**$1,070.00**	**$12,840.00**
07/01/2024 - 06/30/2025	**$1,090.00**	**$13,080.00**
07/01/2025 - 06/30/2026	**$1,110.00**	**$13,320.00**
07/01/2026 - 06/30/2027	**$1,130.00**	**$13,560.00**

EXHIBIT A1

524 CHEROKEE LANE - PARCEL A



Description
A parcel of land located within a portion of Parcel H of Pueblo Memorial Airport Industrial Park Subdivision, located in the SE 1/4 of the NW 1/4 of Section 30, Township 20 South, Range 64 West of the Sixth Principal Meridian, being more particularly described as follows:

Parcel A
BEGINNING at a point from which the monument found at the intersection of Skyway Street and Magnuson Avenue bears S 64° 13' 53" W a distance of 1621.85 feet (bearings based on the monument found at the intersection of Skyway Street and Atlas Avenue to the monument found at the intersection of Skyway Street and Magnuson Avenue to bear N 1° 31' 26" W, with all bearings contained herein being relative thereto); thence N 01° 32' 50" W a distance of 146.57 feet; thence N 88° 27' 10" E a distance of 76.14 feet; thence N 1° 32' 50" W a distance of 25.25 feet; thence N 88° 27' 10" E a distance of 76.65 feet; thence S 01° 32' 50" E a distance of 25.25 feet, thence S 88° 27' 10"W a distance of 49.15 feet; thence S 01° 32' 50" E a distance of 62.17 feet; thence N 88° 27' 10" E a distance of 49.15 feet; thence S 01° 32' 50" E a distance of 95.82 feet; thence S 88° 27' 10"W a distance 65.66 feet; thence N 01° 32' 50"W a distance of 11.43 feet; thence S 88° 27' 10"W a distance of 87.13 feet to the POINT OF BEGINNING.

Area = 0.51 Acres (22,025 S.F.) more or less.

SHEET 1 OF 1


Exhibit A2


Exhibit A3

Exhibit A4



Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Melissa Cook, Director Department of Housing & Citizen Services

SUBJECT: AN ORDINANCE AWARDING AND APPROVING AN AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, AND SAFESIDE FOUNDATION, A COLORADO NON-PROFIT CORPORATION, FOR COMMUNITY SERVICES IN THE AMOUNT OF $210,000.00, FROM PROJECT ACCOUNT HOARP40, HOME-ARP CITY PROJECTS

SUMMARY:

This ordinance awards and approves an agreement to SafeSide Foundation to continue operations at the Pueblo Shelter through December 31, 2026.

PREVIOUS COUNCIL ACTION:

On March 27, 2023, City Council approved Ordinance #10419, accepting the HOME-ARP allocation in the amount of $3,090,925 and incorporating the HOME-ARP Allocation Plan.
On April 13, 2026, City Council approved Ordinance #11152, approving $145,000 transferred from CI2113, ARPA Interest, and $100,000 budgeted and appropriated from the unappropriated fund balance, to account 10180200-58156 – Shelter Operations.

BACKGROUND:

On March 16, 2026, Mayor Graham presented a proposal during the City Council work session to fund the Pueblo Shelter through the remainder of the 2026 calendar year. Without additional support, the shelter's current funding will be exhausted at the end of May 2026, leaving a critical gap in operations for the rest of the year.
To fund shelter operations through 2026, the following was proposed:
$145,000 CI2113, ARPA Interest
$100,000 budgeted and appropriated from the unappropriated fund balance.
$210,000 HOARP40, HOME-American Rescue Plan Act
This additional funding will not only sustain ongoing shelter services through December 31, 2026, but also support the implementation and management of planned capital

improvements at the site, which are expected to come online later in 2026.

FINANCIAL IMPLICATIONS:

Funds in the amount of $210,000 from HOARP40, HOME-ARP will be encumbered.

BOARD/COMMISSION RECOMMENDATION:

Not Applicable.

STAKEHOLDER PROCESS:

Not Applicable.

ALTERNATIVES:

Council could deny this action and it would result in a lack of funding for shelter operations.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. Ordinance 10419
2. SafeSide Community Services Agreement

ORDINANCE NO.

AN ORDINANCE AWARDING AND APPROVING AN AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, AND SAFESIDE FOUNDATION, A COLORADO NON-PROFIT CORPORATION, FOR COMMUNITY SERVICES IN THE AMOUNT OF $210,000.00, FROM PROJECT ACCOUNT HOARP40, HOME-ARP CITY PROJECTS

WHEREAS, a Shelter Operations and Facility Use Agreement was approved by City Council on June 9, 2025; and

WHEREAS, on March 27, 2023, City Council approved Ordinance #10419, accepting the HOME-ARP allocation in the amount of $3,090,925 and

WHEREAS, additional funding is necessary to continue to fund Pueblo Shelter Operations through 2026; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION #6.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

SECTION 1.

The Community Services Agreement, a copy of which is attached and incorporated herein, having been approved as to form by the City Attorney, is hereby approved.

SECTION 2.

The Mayor is hereby authorized to execute said Amendment for and on behalf of the City and the City Clerk is authorized to affix the seal of the City thereto and attest same.

SECTION 3.

The Mayor is hereby authorized to execute an Operating Agreement for and on behalf of the City and the City Clerk is authorized to affix the seal of the City thereto and attest same.

SECTION 4.

The officers and staff of the City are authorized to perform any and all acts consistent with this Ordinance to implement the policies and procedures described herein.

-

SECTION 5.

If any section, paragraph, clause, or provision of this Ordinance shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such section, paragraph, clause, or provision shall not affect any of the remaining provisions of this Ordinance.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____
_____
_____
_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

ORDINANCE NO. 10419

AN ORDINANCE APPROVING AND ADOPTING A SUBSTANTIAL AMENDMENT TO THE CITY OF PUEBLO'S FY2021 ACTION PLAN INCORPORATING THE HOME INVESTMENT PARTNERSHIP AMERICAN RESCUE PLAN (HOME-ARP) ACT FUNDS ALLOCATED TO THE PUEBLO CONSORTIUM, AND AUTHORIZING THE MAYOR TO EXECUTE AND SUBMIT THE SUBSTANTIAL AMENDMENT TOGETHER WITH ALL REQUIRED AND NECESSARY CERTIFICATIONS, ASSURANCES AND DOCUMENTATION TO THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

WHEREAS, the City of Pueblo is designated as the participating jurisdiction of the Pueblo Consortium, and an entitlement city under the Housing and Community Development Act of 1974, and will receive HOME Investment Partnership, American Rescue Plan Act Grant Funds (HOME-ARP) for fiscal year 2021; and

WHEREAS, the City of Pueblo conducted a citizen participation process in accordance with the HOME-ARP requirements that included two public hearings within the City of Pueblo in addition to a third public hearing before City Council to obtain the views of citizens, non-profit, and neighborhood groups on the City's housing and community needs; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The City Council hereby finds and determines that the Substantial Amendment of the City of Pueblo's FY2021 Action Plan containing the HOME-ARP Grant and the HOME-ARP Allocation Plan, dedicating funding for HOME-ARP eligible programs, has been developed to give maximum feasible priority to benefit HOME-ARP Qualifying Populations based on needs identified through public and stakeholder outreach, as required by HUD, and is hereby approved, adopted, and incorporated herein.

SECTION 2.

The Mayor is hereby authorized to execute and submit, in the name of the City of Pueblo, the applications (SF-424/SF-424D) and the Substantial Amendment to the FY2021 Action Plan containing the HOME-ARP Allocation Plan, together with all required and necessary certifications, assurances, and documentation to the U.S. Department of Housing and Urban Development.

SECTION 3.

The officers and staff of the City are authorized to perform any and all acts consistent with this Ordinance to implement the policies and procedures described herein.

SECTION 4.

If any section, paragraph, clause, or provision of this Ordinance shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such section, paragraph, clause, or provision shall not affect any of the remaining provisions of this Ordinance.

SECTION 5.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on March 13, 2023.

Final adoption of Ordinance by City Council on March 27, 2023.

President of City Council

Action by the Mayor:

☒ Approved on March 29, 2023.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on_____

☐ Council action on _____failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: March 27, 2023

TO: President Heather Graham and Members of City Council

CC: Mayor Nicholas A. Gradisar

VIA: Marisa Stoller, City Clerk

FROM: Bryan Gallagher, Director of Housing and Citizen Services

SUBJECT: AN ORDINANCE APPROVING AND ADOPTING A SUBSTANTIAL AMENDMENT TO THE CITY OF PUEBLO'S FY2021 ACTION PLAN INCORPORATING THE HOME INVESTMENT PARTNERSHIP AMERICAN RESCUE PLAN (HOME-ARP) ACT FUNDS ALLOCATED TO THE PUEBLO CONSORTIUM, AND AUTHORIZING THE MAYOR TO EXECUTE AND SUBMIT THE SUBSTANTIAL AMENDMENT TOGETHER WITH ALL REQUIRED AND NECESSARY CERTIFICATIONS, ASSURANCES AND DOCUMENTATION TO THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

SUMMARY:

This Ordinance approves a substantial amendment to the FY2021 Action Plan adopted through Ordinance No. 9975 on July 26, 2021. This amendment to the FY2021 Action Plan incorporates the HOME-ARP Grant into the FY2021 Annual Action Plan and distributes the HOME-ARP funding ($3,090,925.00) in accordance with the HOME-ARP Allocation Plan. The U.S. Department of Housing and Urban Development's approval of the Pueblo Consortium's HOME-ARP Allocation Plan is required to access the funding.

PREVIOUS COUNCIL ACTION:

The City Council passed the FY2021 Annual Action Plan under Ordinance No. 9975 on July 26, 2021, and accepted the HOME-ARP Grant under Ordinance No. 10129 on March 14, 2022.

BACKGROUND:

As an entitlement city, the City of Pueblo is required by the U.S. Department of Housing and Urban Development (HUD) to complete an Annual Action Plan for each of the years of the Consolidated Plan. The City of Pueblo receives HOME Investment Partnership Funds through the Pueblo Consortium authorized by Ordinance No. 9899. The City is required to complete a Substantial Amendment to the Annual Action Plan

when projects are added or deleted or when the funding within the Annual Action Plan is changed by more than ten percent. This Substantial Amendment to the FY2021 Annual Action Plan incorporates the HOME-ARP Grant into the FY2021 Annual Action Plan and dedicates the HOME-ARP Grant funding in accordance with the HOME-ARP Allocation Plan included with this Substantial Amendment. The HOME-ARP Allocation Plan and the accompanying documentation serves to amend the City's original application to HUD for the FY2021 Community Development Block Grant (CDBG) and HOME Investment Partnership Act Grant (HOME).

A public meeting was held to receive citizen input and to hear applicant presentations on January 10, 2023. Notice of the proposed Substantial Amendment to the Annual Action Plan was published on February 27, 2023 and the text thereof made available to the public for review on February 28, 2023, formally opening the public comment period for fifteen-days. Public meetings were held on January 10, 2023, and March 10, 2023. Copies were available at the City Clerk's Office, the Rawlings Library, the Department of Housing and Citizen Services (Department), and the City's website.

FINANCIAL IMPLICATIONS:

The Pueblo Consortium will have access to $3,090,925.00 dedicated to assist homeless individuals and families, those at risk of homelessness, those fleeing domestic violence, and other populations identified in Section IV of the HUD Community, Planning, and Development Notice 21-10 published on September 13, 2021.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

The following stakeholder processes were undertaken by the Department and the Pueblo County Department of Human Services. On December 21, 2022 and December 23, 2022, notice of public hearing to receive public input for the development of the HOME-ARP allocation plan was printed in *The Pueblo Chieftain*. Public hearings were held in City Council Chambers on January 10, 2023 and March 10, 2023. Six, one-hour, stakeholder sessions were held between January 25, 2023 and February 2, 2023 to gain input on the community's homeless population in the following areas: issues specific to veteran populations, issues specific to those fleeing domestic violence and human trafficking, issues related to fair housing, issues specific to the Spanish speaking population, and issues the homeless services providers have identified through their service.

ALTERNATIVES:

The City Council can choose to not to adopt the Substantial Amendment to the FY2021 Annual Action Plan and forego the HOME-ARP funds.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. Pueblo CO_Display HOME-ARP Plan
2. Pueblo_SF424_4_0-V4.0 (002)
3. Pueblo_SF424B-V1.1
4. Pueblo_SF424D-V1.1

OMB Number: 4040-0007
Expiration Date: 02/28/2025

ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C.§§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.

10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.

15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.

16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

19. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
Nicholas Gradisar	Mayor
APPLICANT ORGANIZATION	DATE SUBMITTED
City of Pueblo	3-21-2023

Standard Form 424B (Rev. 7-97) Back

ASSURANCES - CONSTRUCTION PROGRAMS

OMB Number: 4040-0009
Expiration Date: 02/28/2025

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PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant:, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure non-discrimination during the useful life of the project.
4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progressive reports and such other information as may be required by the assistance awarding agency or State.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards of merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
10. Will comply with all Federal statutes relating to non-discrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681 1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29) U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statue(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statue(s) which may apply to the application.

11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333) regarding labor standards for federally-assisted construction subagreements.

14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq).

18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

20. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
Nicholas Gradisar	Mayor
APPLICANT ORGANIZATION	DATE SUBMITTED
City of Pueblo	3-29-2023

SF-424D (Rev. 7-97) Back

OMB Number: 4040-0004
Expiration Date: 12/31/2022

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received:

4. Applicant Identifier: HOME-ARP Grant

5a. Federal Entity Identifier:

5b. Federal Award Identifier: M-22-DC-08-0205

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: City of Pueblo

* b. Employer/Taxpayer Identification Number (EIN/TIN): 84-6000615

* c. UEI: NJK3BNUDRHJ7

d. Address:

* Street1: 1 City Hall Place
Street2:
* City: Pueblo
County/Parish:
* State: CO: Colorado
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 81003-1427

e. Organizational Unit:

Department Name: Housing and Citizen Services

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Mr.
* First Name: Bryan
Middle Name: Patrick
* Last Name: Gallagher
Suffix:

Title:

Organizational Affiliation: Director

* Telephone Number: 719-553-2849
Fax Number:

* Email: bgallagher@pueblo.us

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

C: City or Township Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Department of Housing and Urban Development

11. Catalog of Federal Domestic Assistance Number:

14.239

CFDA Title:

HOME Investment Partnership

*** 12. Funding Opportunity Number:**

* Title:

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

HOME Investment Partnership Program American Rescue Plan Act (HOME-ARP) funds assist the City of Pueblo to provide programs and housing directed to assist homeless individuals and families.

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: 3 | * b. Program/Project: 3

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 01/01/2023 | * b. End Date: 09/30/2030

18. Estimated Funding ($):

* a. Federal	3,090,925.00
* b. Applicant	
* c. State	
* d. Local	
* e. Other	
* f. Program Income	
* g. TOTAL	3,090,925.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix:	Mr.
* First Name:	Nicholas
Middle Name:	A.
* Last Name:	Gradisar
Suffix:	
* Title:	Mayor
* Telephone Number:	719-553-2655
Fax Number:	
* Email:	ngradisar@pueblo.us
* Signature of Authorized Representative:	Nicholas Gradisar
* Date Signed:	3-29-2023

AGREEMENT FOR COMMUNITY DEVELOPMENT SERVICES
(Subrecipient Agreement)
(Non-profit entity)

THIS AGREEMENT ("Agreement") is made and entered into this 30th day of June 2026, by and between the City of Pueblo, a Municipal Corporation, hereinafter referred to as the "City" and **Safeside Foundation, a Colorado nonprofit corporation**, hereinafter referred to as the "Subrecipient" for **Shelter Operations.**

WITNESSETH THAT:

WHEREAS, the City has entered grant agreements with the U.S. Department of Housing and Urban Development ("HUD") whereby federal financial assistance may be made available to the City through the HOME Investment Partnership, American Rescue Plan Act Grant Funds (HOME-ARP); and

WHEREAS, pursuant to such grant agreements the City is undertaking certain activities necessary for the execution of a project situated in the project area described in the Scope of Services; and

WHEREAS the City desires to disburse funds to the Subrecipient to execute certain projects and/or perform certain services in connection with such undertaking of the City; and

WHEREAS, Subrecipient has represented to the City that is duly qualified, eligible and willing to undertake certain projects and/or services identified herein and in the Scope of Services attached hereto.

NOW, THEREFORE, in consideration of the foregoing recitals and the terms and conditions set forth herein, the parties hereto do mutually agree as follows:

1. SCOPE OF SERVICES; RESPONSIBILITIES OF SUBRECIPIENT

(a) Subrecipient agrees to satisfactorily perform and complete all services and items of work, and furnish all labor and materials encompassed within or reasonably necessary to accomplish the tasks and functions described in the Scope of Services attached hereto as Exhibit "A" and incorporated herein by reference, in full compliance with all provisions of this Agreement.

(b) Subrecipient warrants and represents that it: (i) has the requisite authority and capacity to perform all terms and conditions on Subrecipient's part to be performed hereunder; (ii) that it is duly organized as a non-profit organization under state law and is in good standing with the Secretary of State of Colorado; (iii) that it is fully aware of and understands its duty to perform all functions and services in accordance with the regulatory requirements of 24 CFR Part 570 and those identified in Exhibit "C" hereto; and (iv) that it is accepting federal financial assistance hereunder subject to certain mandatory repayment provisions.

2. RESPONSIBILITIES OF THE CITY

The City shall designate a representative of the City who will be authorized to make all necessary decisions required of the City on behalf of the City in connection with the performance of this Agreement and the disbursement of funds in connection with the program. In the absence of such a designation, the Mayor shall be deemed as City's authorized representative.

3. SUBRECIPIENT'S COMPENSATION AND METHOD OF PAYMENT

(a) The City will pay to Subrecipient an amount up to that specified in subparagraph (c) of this paragraph as full compensation for all services and work to be performed or undertaken by Subrecipient under this Agreement. Payment of funds to Subrecipient is subject to all of the following requirements, which shall be conditions precedent to payment: (i) that Subrecipient has expended funds for eligible approved expenditures, (ii) that Subrecipient is not in default of any material provision of this Agreement nor applicable law or

regulation, (iii) that Subrecipient has timely submitted requests for payment or reimbursement detailing the eligible payment or reimbursement items in a format approved by City, (iv) that Subrecipient has certified with each payment or reimbursement request compliance with the requirements identified in Exhibit "C" and that all expenditures for which reimbursement is sought were made for and in furtherance of an approved project and are an eligible use of federal assistance under the Act and federal regulations, and (v) that City has timely received from HUD sufficient federal assistance under the Act to make the payment or reimbursement hereunder.

(b) Payment hereunder is also subject to and may only be disbursed in accordance with applicable HUD regulations including but not limited to those at 24 CFR Part 570, as presently promulgated and as same may be revised from time to time in the future, all other terms of this Agreement, and any special provisions in the Scope of Services. All payments received by Subrecipient hereunder are subject to repayment by Subrecipient as provided in 24 CFR Part 570.

(c) The aggregate of all payments made hereunder shall not exceed **Two hundred and ten thousand and 00/100 Dollars (U.S. $210,000.00).**

(d) Upon expiration of the term of this Agreement or upon any prior termination, Subrecipient shall transfer to City any funds provided hereunder which are on hand at the time of expiration or termination together with any accounts receivable attributable to the use of funds provided hereunder.

4. TERM OF AGREEMENT

The term of this Agreement shall be from **July 1, 2026,** to **December 31, 2026,** unless sooner terminated as herein provided.

5. TERMINATION OF AGREEMENT

(a) For Cause: This Agreement may be terminated by City for cause, including any nonperformance by the Subrecipient, upon ten (10) days written notice to Subrecipient including a statement of the reasons therefore, and after an opportunity for a hearing has been afforded. If a hearing is requested, it shall be held before the City's Director of Housing and Citizen Services whose decision shall be final. The determination of the City as to the cause of termination and the appropriateness thereof shall be final and binding upon both City and Subrecipient. In accordance with 24 CFR Part 570, cause for termination shall include any material failure by Subrecipient to comply with any term of this Agreement.

(b) For Convenience: This Agreement may be terminated for convenience in accordance with the provisions of 24 CFR Part 570. This Agreement shall automatically terminate at the end of its term as well as in the event of any suspension, reduction or non-receipt of Community Development funds by City.

(c) Post Termination Procedures: In the event of termination, all property acquired by Subrecipient with grant funds, all grant funds, program income, and loans originated with grant funds or by payments therefrom and payments received under such mortgage loans held, owned or retained by the Subrecipient shall immediately become the sole and separate property of the City and the Subrecipient shall perform all acts and execute all instruments necessary to transfer and assign such property, funds, income, and mortgage loans to City. Everything finished or unfinished, documents, data, studies, reports, and work product prepared by the Subrecipient under this Agreement or with grant funds shall, at the option of the City, become City's property and the Subrecipient shall be entitled to receive just and equitable compensation only for satisfactory work completed for which compensation has not previously been paid nor reimbursement made. Subrecipient shall vacate all of its operations, property and staff from any City buildings or real property.

6. ASSIGNABILITY

This Agreement shall not be assigned or transferred by the Subrecipient without the prior written consent of the City. Any assignment or attempted assignment made in violation of this provision shall, at City's election, be deemed void and of no effect whatsoever.

7. CONFLICT OF INTEREST

The Subrecipient certifies and warrants that neither it nor any members of its Boards of Directors, officers or employees has or will derive any personal or financial interest or benefit from the activity or activities assisted pursuant to this Agreement, nor has an interest in any contract, subcontract or agreement with respect thereunto, nor the proceeds thereunder, either for themselves or for those with whom they have family or business ties, during their tenure and for one year thereafter. Subrecipient shall avoid all conflicts of interest which are prohibited by applicable federal regulations including but not limited to those set forth in 24 CFR Part 570 as presently promulgated and as same may be revised from time to time in the future.

8. SUBRECIPIENT RECORDS

Subrecipient shall maintain records as to all services provided, reimbursable expenses incurred in performing the Scope of Services and complete accounting records. Accounting records shall be kept on a generally recognized accounting basis and as requested by the City's auditor. The Subrecipient agrees to comply with all applicable uniform administrative requirements described or referenced in 24 CFR 570.502. The Compliance Provisions attached as Exhibit "B" hereto are made a part of this Agreement and Subrecipient agrees to perform and comply with same. The City, HUD, Comptroller General of the United States, the Inspector General of HUD and any of their authorized representatives, shall have the right to inspect and copy, during reasonable business hours, all books, documents, papers and records of the Subrecipient which relate to this Agreement for making an audit or examination. Upon completion of the work and end of the term of this Agreement, the City may require all Subrecipient's financial records relating to this Agreement to be turned over to City.

9. MONITORING AND EVALUATION

The City shall have the right to monitor and evaluate the progress and performance of the Subrecipient to assure that the terms of this Agreement are being satisfactorily fulfilled in accordance with HUD's, City's and other applicable monitoring and evaluation criteria and standards. The City shall at least quarterly review the Subrecipient's performance using on-site visits, progress reports required to be submitted by the Subrecipient, audit findings, disbursements transactions and contact with the Subrecipient as necessary. The Subrecipient shall furnish to the City monthly or quarterly program and financial reports of its activities in such form and manner as may be requested by the City. Subrecipients shall fully cooperate with City relating to such monitoring and evaluation.

10. SUBRECIPIENT FILES AND INFORMATION REPORTS

The Subrecipient shall maintain files containing information which shall clearly document all activities performed in conjunction with this Agreement, including, but not limited to, financial transactions, conformance with assurances, activity reports, and program income. These records shall be retained by the Subrecipient for a period of three years after the completion of the project. Activity reports shall be submitted monthly or quarterly no later than the fifteenth day of the month following the end of month or quarter for which the report is submitted, and no later than the following dates:

1. **First Quarter: (July 1 – September 30) – October 15, 2026**
2. **Second Quarter: (October 1 – December 31) – January 15, 2027**
3. **Close-out Report: January 15, 2027**

11. INDEPENDENCE OF SUBRECIPIENT

Nothing herein contained nor the relationship of Subrecipient to City, which relationship is expressly declared to be that of an independent contractor, shall make or be construed to make Subrecipient or any of Subrecipient's agents or

employees the agents or employees of the City. Subrecipient shall be solely and entirely responsible for its acts and the acts of its agents, employees and subcontractors.

12. LIABILITY, INSURANCE

(a) As to the City, Subrecipient agrees to assume the risk of all personal injury, including death and bodily injury, and damage to and destruction of property, including loss of use therefrom, caused by or sustained, in whole or in part, in conjunction with or arising out of the performance or nonperformance of this Agreement by Subrecipient or by the conditions created thereby. Subrecipient further agrees to indemnify, defend, and save harmless the City, its officers, agents and employees, from and against all claims, liabilities, costs expenses, penalties and attorney fees arising from such injuries to persons or damages to property or based upon or arising out of the performance or nonperformance of this Agreement by Subrecipient or out of any violation by Subrecipient of any statue, ordinance, rule or regulation.

(b) Subrecipient agrees that it shall procure and will maintain during the term of this Agreement, such insurance as will protect it from claims under workers' compensation acts, claims for damages because of personal injury including bodily injury, sickness or disease or death of any of its employees or of any person other than its employees, and from claims or damages because of injury to or destruction of property including loss of use resulting therefrom; and such insurance will provide for coverage in such amounts as set forth in subparagraph (c).

(c) The minimum insurance coverage which Subrecipient shall obtain and keep in force is as follows:

(i) Workers' Compensation Insurance complying with statutory requirements in Colorado.

(ii) Comprehensive General and Automobile Liability Insurance with limits not less than Six Hundred Thousand and No/100 Dollars ($600,000) per person and occurrence for personal injury, including but not limited to death and bodily injury, and Six Hundred Thousand and No/100 Dollars ($600,000) per occurrence for property damage.

(d) In the event Subrecipient's obligations under this Agreement are secured by a deed of trust or mortgage instrument as provided in paragraph 14 (c) of this Agreement, Subrecipient agrees to procure and maintain, at its own expense, hazard and fire insurance upon the property described in said deed of trust on an all-risk form in such amounts of all liens against the property and the amount of funds provided by City pursuant to this Agreement. Subrecipient shall furnish a certificate of insurance certifying such coverage to City's Director of Finance prior to disbursement of any funds to Subrecipient. Both said certificate of insurance and the policy procured by Subrecipient shall name the City as an additional insured and loss payee.

13. CERTIFICATIONS

The Subrecipient agrees to execute and abide by the certifications contained in Exhibit "C" hereto, which are hereby made a part of this Agreement. Subrecipient will have any contractors or subcontractors agree to execute and abide by the certifications contained in Exhibit "C" to this Agreement.

14. PROGRAM INCOME; REVERSION OF ASSETS

(a) Unless otherwise authorized by City in writing, all program income shall be returned to City within 30 days of receipt by Subrecipient. In the event City authorizes Subrecipient to retain any portion of program income, it shall only be used to accomplish the work set forth in the Scope of Services, and the amount of grant funds payable by City to Subrecipient shall be adjusted as provided by 24 CFR 570.504(b)(2)(i) and (ii).

(b) Upon expiration of the term of this Agreement, or upon any prior termination, Subrecipient shall transfer to City any funds provided hereunder which are on hand at the time of expiration or termination together with any accounts receivable attributable to the use of funds provided hereunder.

(c) Any real property under Subrecipient's control that was acquired or improved in whole or in part with funds provided pursuant to this Agreement in excess of U.S. $25,000 shall either: (i) be used to meet one of the

national objectives set forth in 24 CFR 570.208 until five years after expiration or termination of this Agreement, or (ii) not be used in accordance with subparagraph (c)(i), in which event Subrecipient shall pay to City an amount equal to the current market value of the property less any portion of the value attributable to expenditures of funds not provided under this Agreement for the acquisition of, or improvement to the property. The use restriction and repayment obligation set forth in this subparagraph shall survive termination or expiration of this Agreement and shall be fully enforceable and subject to collection by City or HUD in accordance with applicable laws. If requested by City, Subrecipient shall execute a deed of trust or mortgage instrument which shall be and constitute a lien upon all real property acquired or improved with funds provided hereunder, and which shall secure all obligations of Subrecipient hereunder.

(d) In the event City incurs any costs or expenses in enforcing the requirements of this paragraph 14 or in bringing any action to recover the property or amount of any repayment obligation, City shall be entitled to recover its costs and expenses, including reasonable attorneys' fees.

15. SPECIAL REQUIREMENTS APPLICABLE TO IMPROVEMENTS TO PROPERTY

(a) In addition to all procurement requirements otherwise applicable to Subrecipient pursuant to any other provision of this Agreement or pursuant to any requirement of law or regulation incorporated in this Agreement by reference, if any portion of the funds provided to Subrecipient under this Agreement is to be used for making improvements to real property, including new construction, rehabilitation, or remodeling, then in such event Subrecipient shall comply with all requirements of this Paragraph 15.

(b) No improvements shall be undertaken to real property with funds (or reimbursement) provided hereunder unless and until: (i) plans and specifications therefore have been prepared by a registered Professional Engineer in good standing and duly licensed to practice in the State of Colorado or an Architect duly licensed and authorized to conduct a practice of architecture in the state of Colorado; (ii) such plans and specifications have been filed with the City and approved by both the City's designated representative and the City's Director of Public Works; and (iii) all construction contracts for improvements for which payment is sought from City shall have been awarded only after an open, competitive bidding process which has been approved by City's Director of Purchasing and which allows qualified contractors to reasonable participate in the competitive bidding procedures.

(c) If this Paragraph 15 is applicable, no disbursement of funds to Subrecipient shall be made by City hereunder unless and until all conditions precedent to payment specified elsewhere in this Agreement have been satisfied and Subrecipient files with City's Director of Housing and Citizen Services a written request for payment signed by an officer of Subrecipient that certifies: (i) that the amounts included in the request for payment have not been included in any prior request for payment, and (ii) that the improvements listed therein for which payment is sought have been completed in accordance with the approved plans and specifications therefore.

(d) In every contract for construction of improvements for which payment or reimbursement from City is to be provided under this Agreement, Subrecipient shall include a contract clause or clauses, approved by City's Director of Purchasing, requiring the contractor, and all of the contractor's subcontractors of all tiers, to comply with the requirements of the Davis-Bacon Act and implementing regulations, and to pay all laborers and mechanics engaged in work upon the improvements at the prevailing wage rates for such work as determined by the U.S. Department of Labor.

16. RECOGNITION OF HUD, CITY

In all printed materials, project descriptions and other activities undertaken with funds provided under this Agreement, Subrecipient shall provide recognition that funds have been provided by U.S. Department of Housing and Urban Development and the City of Pueblo. Recognition shall be accomplished by prominent disclosure of the role of HUD and City in all such printed materials and project signage, if any.

17. PERA LIABILITY

The Subrecipient shall reimburse the City for the full amount of any employer contribution required to be paid by the City of Pueblo to the Public Employees' Retirement Association ("PERA") for salary or other compensation paid to a PERA retiree performing contracted services for the city under this Agreement. The Subrecipient shall fill out the questionnaire attached as Exhibit "D" and submit the completed form to Finance Office as part of the signed Agreement.

18. ENTIRE AGREEMENT; AMENDMENTS

The provisions set forth in this Agreement, and all Exhibits and attachments to this Agreement, constitute the entire and complete agreement of the parties hereto and supersede all prior written and oral agreements, understandings or representations related thereto. No amendment or modification of this Agreement, and no waiver of any provisions of this Agreement shall be binding unless made in writing and executed by the duly authorized officers of both the Subrecipient and City.

19. GOVERNING LAW AND VENUE

This Agreement shall be governed by the laws of the State of Colorado. Venue for any action arising under this Agreement or for the enforcement of this Agreement shall be in a state court with jurisdiction located in Pueblo County, Colorado.

20. AUTHORITY FOR SIGNATURES; ELECTRONIC SIGNATURES

(a) The persons signing this Agreement on behalf of Subrecipient represent and warrant that such persons and Subrecipient have the requisite power and authority to enter, execute and deliver this Agreement and that this Agreement is a valid and legally binding obligation of Subrecipient enforceable against Subrecipient in accordance with its terms.

(b) This Agreement and all other documents contemplated hereunder may be executed using electronic signatures with delivery via facsimile transmission, by scanning and transmission of electronic files in Portable Document Format (PDF) or other readily available file format, or by copy transmitted via email, or by other electronic means and in one or more counterparts, each of which shall be: (i) an original, and all of which taken together shall constitute one and the same agreement, (ii) a valid and binding agreement and fully admissible under state and federal law, and (iii) enforceable in accordance with its terms.

21. FUND AVAILABILITY; SUBJECT TO LAW

(a) Financial obligations of City, if any, after the current year in which this Agreement is signed by both parties are contingent upon funds for that purpose being appropriated, budgeted and otherwise made available by HUD, Pueblo City Council and City executive departments. Nothing herein shall be deemed to create an ongoing financial obligation of City.

(b) This Agreement is expressly made subject to the limitations of the Colorado Constitution. Nothing herein shall constitute, nor be deemed to constitute, the creation of a debt or multi-year fiscal obligation or an obligation of future appropriations by the City Council of Pueblo, contrary to Article X, §20 of the Colorado Constitution or any other constitutional, statutory or charter debt limitation. Notwithstanding any other provision of this Agreement, with respect to any financial obligation of City which may arise under this Agreement in any fiscal year, in the event the budget or other means of appropriations for any such year fails to provide funds in sufficient amounts to discharge such obligation, such failure shall not constitute a default by or breach of this Agreement, including any sub-agreement, attachment, schedule or exhibit thereto, by the City. City may in its sole and absolute discretion terminate this Agreement for reasons of non-appropriation immediately upon written notice without causing default or breach.

(c) Nothing in this Agreement is intended, nor should it be construed, to create or extend any rights, claims or benefits or assume any liability for or on behalf of any third party, or to waive any immunities or limitations otherwise conferred upon the City of Pueblo, a Municipal Corporation under or by virtue of federal or state law, including but not limited to the Colorado Governmental Immunity Act, C.R.S. §24-10-101, et seq.

IN WITNESS, WHEREOF, the Subrecipient and the City have executed this Agreement as of the date first above written and under the laws of the State of Colorado.

ATTEST:

CITY OF PUEBLO,
A MUNICIPAL CORPORATION

_____
City Clerk

By_____
Heather Graham Mayor

[S E A L]

SUBRECIPIENT:
Safeside Foundation

ATTEST:

By_____
Signature

By_____
Signature

Name_____

Name_____

Title_____

Title_____

EXHIBIT A
SCOPE OF SERVICES

A. Principal Tasks

The Subrecipient will be responsible for administering shelter response services for low-income individuals and families. The Subrecipient will administer all tasks for the aforesaid program in compliance with all applicable federal, state and local rules and regulations governing these funds and, in a manner, satisfactory to the City.

The major goals of the Subrecipient's efforts under this Agreement will be as follows:

1. SafeSide shall manage the day-to-day shelter operations with a minimum of 92 beds at the Property located at 728 West 4th, Pueblo, CO 81003..

2. SafeSide shall manage the operation of the Emergency Shelter located at 710 West 4th, Pueblo, CO 81005 with a minimum of 51 available beds.

3. Should the City install Non-congregate Modular Shelter Units "Units", SafeSide shall manage the operation of the Units.

4. For each of the shelter types set forth in the preceding paragraphs within the Leased Premises, as descried in the Shelter Operations and Facility Use Agreement dated June 9, 2025, SafeSide shall hire, supervise, train, and schedule all employees and subcontractors needed and required for the efficient operation, maintenance, and management of the same, including but not limited to the following services:

   (a) all sanitary, cleaning, pest removal, and janitorial services,
   (b) certified food services,
   (c) security, and
   (d) overnight shift coverage.

5. SafeSide shall provide prompt, courteous, and respectful service. SafeSide shall provide reasonable accommodations for overnight residents with disabilities as required by local, state and federal law.

6. Shelter staff shall utilize strong partnerships with community organizations that deal frequently with chronically homeless individuals (i.e., homeless outreach programs, law enforcement, mental health providers, hospitals) to identify potential participants.

7. SafeSide shall serve a variety of individuals and families, when appropriate space is available, who may otherwise not be able to access existing shelter facilities due to extensive behavioral health challenges, opioid use disorder, substance abuse disorder, mental health conditions, medical issues, provided that SafeSide may refer individuals to other resources in the event their needs exceed what SafeSide is able to reasonably support.

8. SafeSide shall make reasonable efforts to communicate with community partners directly about shelter services, criteria, and how to access services so that information is also readily available to potential participants.

9. SafeSide shall provide onsite security and develop a plan to mitigate any potential impacts to the surrounding neighborhoods, while ensuring a high-level of safety for program participants and support staff.

10. SafeSide shall immediately notify the City by phone of serious incidents, including physical injuries, misconduct, property damage, trespass, security breaches, claims, or police intervention on the Leased Premises. Written incident reports must be submitted to the City within 24 hours of the incident.

Changes in the scope of services, budget, or method of compensation contained in this Agreement, unless otherwise noted, may only be made through a written amendment to this Agreement, executed by the Subrecipient and City.

Subrecipient will submit at a minimum, quarterly reports that address the Subrecipient's ability to meet the goals and outcomes.

B. Budget and Method of Compensation

The Subrecipient will submit reimbursement requests for services rendered, operating expenditures and materials purchased supported by original invoices.

Approved budget is as follows:

Personnel Services:

Salaries, fringe	$210,000.00
TOTAL	**$210,000.00**

C. Performance Monitoring:

The City will monitor the performance of the Subrecipient against goals and performance standards required herein. Substandard performance as determined by the City will be considered non-compliance with this agreement. If actions to correct such substandard performance are not taken by the Subrecipient within a reasonable period of time after being notified by the City contract suspension or termination procedures will be initiated.

D. Time of Performance:

Services shall start on the **July 1, 2026,** and end on the **December 31, 2026**. The term of this agreement and the provisions herein shall be extended to cover any additional time period during which the Subrecipient remains in control of HOME-ARP funds and other assets including program income.

EXHIBIT B
COMPLIANCE PROVISIONS INCORPORATED
IN A CONTRACT FOR SERVICES

1. An accounting system using the accrual basis of generally accepted accounting principles which accurately reflects all costs chargeable (paid and unpaid) to the project should the project terminate the next day is mandatory. A receipts and disbursements ledger must be maintained. A general ledger with an income and expense account for each budgeted line item is necessary. Paid invoices revealing check number, date paid, and item is necessary. Paid invoices revealing check number, date paid, and evidence of goods or services received are to be filed per the expense account they were charged. The City must review and approve your account system and internal controls prior to the release of funds.

2. There is no flexibility on budgets. Line items may be changed only by the City's written concurrence of a budget amendment.

3. A log listing all long-distance telephone calls must be maintained (showing date, city and agency called, person making call and person called).

4. Eligible expenses are those considered reasonable and necessary costs for the efficient operation of the program as determined by the City. All costs must be budgeted items. Request for advance or reimbursements of expenses must be accompanied by:

1. Original invoice marked with funding source
2. Detailed listing of each expense showing:
    a) recipient
    b) brief description of purchase
    c) amount with method of computation detailed

Cost Summary must be submitted monthly to reflect entries through the closing date for the books (indicate Closing Date on Cost Summary).

5. All employees handling funds are required to be insured by a fidelity bond.

6. The City shall not be obligated to any third parties of the Subrecipient. Each Subrecipient is further cautioned against obligating funds beyond the contract date of the agreement between the City and the Subrecipient. (Example: rent or lease agreements, service contracts, insurance, etc.)

7. The contractor will furnish the City such statements, records, data and information, and permit such interviews with personnel as the City may request to effectively monitor and evaluate the project.

8. City auditors will periodically make interim audits and may, upon completion of the project, make a final audit.

9. All records must be retained by the agency for a period of three years following the last day of each contract. (Cost summary reports must reflect actual general ledger balances.)

10. Subrecipient will have any contractors or subcontractors agree to execute and abide by the certifications contained in Exhibit "C" to this Agreement.

EXHIBIT C
CERTIFICATIONS

Subrecipient hereby certifies that the grant will be conducted and administered in compliance with:

(1) Title VI of the Civil Rights Act of 1964 (Pub. L. 88-352; 42 U.S.C. 2000d, et seq.) and implementing regulations issued at 24 CFR Part 1;

(2) Title VIII of the Civil Rights Act of 1968 (Pub. L. 90-284; 42 U.S.C. 3601, et seq.), as amended; and that the grantee will administer all programs and activities related to housing and community development in a manner to affirmatively further fair housing;

(3) Section 109 of the Housing and Community Development Act of 1974, as amended, and the regulations issued pursuant thereto;

(4) Section 3 of the Housing and Urban Development Act of 1968, as amended;

(5) Executive Order 11246, as amended by Executive Orders 11375 and 12086, and implementing regulations issued at 41 CFR Chapter 60;

(6) Executive Order 11063, as amended by Executive Orders 12259, and implementing regulations at 24 CFR Part 107;

(7) Section 504 of the Rehabilitation Act of 1973 (Pub. L. 93-112), as amended, and implementing regulations when published for effect;

(8) The Age Discrimination Act of 1975 (Pub. L. 94-135), as amended, and implementing regulations when published for effect;

(9) The relocation requirements of Title II and the acquisition requirements of Title III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, and the HUD implementing regulations set forth in 24 CFR Part 42;

(10) Executive Order 11988 relating to the evaluation of flood hazards and Executive Order 11288 relating to the prevention, control and abatement of water pollution;

(11) The flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (Pub. L. 93-234);

(12) The applicable regulations, policies, guidelines and requirements of OMB Circular Nos. A-102, Revised, 24 CFR Part 570, and Subpart J of 24 CFR 570, A-87, A-110, A-122, A-128 and A-133 as they relate to the acceptance and use of federal funds under this federally-assisted program;

(13) The Clean Air Act (42 U.S.C. 7401 et seq.) as amended, particularly section 176 (c) and (d) [42 U.S.C. 7506 (c) and (d)];

(14) HUD environmental criteria and standards [24 CFR Part 51, Environmental Criteria and Standards];

(15) The Safe Drinking Water Act of 1974 (42 U.S.C. 201, 300 (f) et seq., and 21 U.S.C. 349) as amended, particularly section 1424 (e) (42 U.S.C. 300 (h)-303 (e));

(16) The Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) as amended, including but not limited to section 7 (16 U.S.C. 1536) thereof;

(17) The Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1272 et seq.) as amended, particularly section 7 (b) and (c) [16 U.S.C. 1278 (b) and (c)];

(18) The Reservoir Salvage Act of 1960 (916 U.S.C. 469 et seq.), particularly section 3 (16 U.S.C. 469a-1), as amended by the Archeological and Historical Preservation Act of 1974;

(19) Flood Disaster Protection Act of 1973 (42 U.S.C. 4001 et seq.) as amended, particularly sections 102(a) and 202(a) [42 U.S.C. 4012a(a) and 4106(a)];

(20) Executive order 11990, Protection of Wetlands, May 24, 1977 (42 FR 26961 et seq.), particularly sections 2 and 5;

(21) It will comply with the Lead-Based Paint Poisoning Prevention requirements of 25 CFR Part 35 issued pursuant to the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821 et seq.);

(22) The National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.) as amended, particularly section 106 (16 U.S.C. 470f); and

(23) Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 13, 1971 (36 FR 8921 et seq.), particularly section 2(c).

(24) Construction work financed in whole or in part with federal funds is subject to the prevailing wage requirements of the Davis-Bacon Act (29 CFR, Parts 3 and 5), the Copeland Act (29 CFR Part 3), and the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96). When a project meets this applicability requirement, the labor standards provision of the HUD 4010 and the Davis-Bacon Wage Decision issued for the project will be incorporated into this contract document and shall be incorporated into all construction contracts and subcontracts of any tier thereunder.

(25) No HOME-ARP funds may be expended for lobbying purposes and payments from other sources for lobbying must be disclosed (24 CFR Part 87).

(a) No federally appropriated funds have been or will be paid, by or on behalf of subrecipient, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.

(b) If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federal contract, grant, loan, or cooperative agreement, it will complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

(26) Where asbestos is present in property undergoing rehabilitation, Federal requirements apply regarding worker exposure, abatement procedures and disposal. (CPD-90-44 EPA/OSHA).

(27) When HOME Investment Partnership Act funds are used, the Subrecipient will comply with implementing regulations and requirements under (24 CFR 92).

Signature: _____

Subrecipient

EXHIBIT D
COLORADO PUBLIC EMPLOYEES' RETIREMENT ASSOCIATION
SUPPLEMENTAL QUESTIONNAIRE TO BE ANSWERED BY
ANY BUSINESS PERFORMING SERVICES FOR THE CITY OF PUEBLO

Pursuant to section 24-51-1101(2), C.R.S., salary or other compensation from the employment, engagement, retention or other use of a person receiving retirement benefits (Retiree) through the Colorado Public Employees Retirement Association (PERA) in an individual capacity or of any entity owned or operated by a PERA Retiree or an affiliated party by the City of Pueblo to perform any service as an employee, contract employee, consultant, independent contractor, or through other arrangements, is subject to employer contributions to PERA by the City of Pueblo. Therefore, as a condition of contracting for services with the City of Pueblo, this document must be completed, signed and returned to the City of Pueblo:

a) Are you, or do you employ or engage in any capacity, including an independent contractor, a PERA Retiree who will perform any services for the City of Pueblo? Yes___, No___.

b) If you answered "yes" to (a) above, please answer the following question: Are you an individual, sole proprietor or partnership, or a business or company owned or operated by a PERA Retiree or an affiliated party? Yes ____, No____.
If you answered "yes" please state which of the above entities best describes your business:
_____

c) If you answered "yes" to both (a) and (b), please provide the name, address and social security number of each such PERA Retiree.

_____	_____
Name	Name
_____	_____
Address	Address
_____	_____
Social Security Number	Social Security Number

(If more than two, please attach a supplemental list)

Failure to accurately complete, sign and return this document to the City of Pueblo may result in your being denied the privilege or doing business with the City of Pueblo.

If you answered "yes" to both (a) and (b), you agree to reimburse the City of Pueblo for any employer contribution required to be paid by the City of Pueblo to PERA for salary or other compensation paid to you as a PERA Retiree or paid to any employee or independent contractor of yours who is a PERA Retiree performing services for the City of Pueblo. You further authorize the City of Pueblo to deduct and withhold all such contributions from any moneys due or payable to you by the City of Pueblo under any current or future contract or other arrangement for services between you and the City of Pueblo.

Signed _____, 20_____.

By: _____

Name: _____

Title: _____

For purposes of responding to question (b) above, an "affiliated party" includes (1) any person who is the named beneficiary or co-beneficiary on the PERA account of the PERA Retiree; (2) any person who is a relative of the PERA Retiree by blood or adoption to and including parents, siblings, half-siblings, children, and grandchildren; (3) any person who is a relative of the PERA Retiree by marriage to and including spouse, spouse's parents, stepparents, stepchildren, stepsiblings, and spouse's siblings; and (4) any person or entity with whom the PERA Retiree has an agreement to share or otherwise profit from the performance of services for the City of Pueblo by the PERA Retiree other than the PERA Retiree's regular salary or compensation.

ADDITIONAL REPORTING REQUIREMENTS
Safeside Foundation

You must submit the following forms and/or information with your signed contract(s).

A. Board of Directors Roster;
B. Staff Roster;
C. Budget.

You must submit the following forms and information with each request for disbursement of funds.

A. Request for reimbursement form;
B. Copies of canceled checks;
C. Copies of invoices or receipts;
D. Signed payroll sheets;
E. Demographic information of clients served (can be done quarterly);
F. Any other report or information as required by the grantor or federal agency.

Requests for disbursements of HOME-ARP funds will not be processed until all necessary information and forms are complete. Incomplete requests will be returned to the agency.

_____
Executive Director

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Elizabeth Drake, Assistant City Attorney
Barb Huber, Fire Chief

SUBJECT: AN ORDINANCE REPEALING CHAPTER 2, TITLE III OF THE PUEBLO MUNICIPAL CODE RELATING TO AND ADOPTING A NEW CHAPTER 2, TITLE III OF THE 2021 INTERNATIONAL FIRE CODE PUBLISHED BY THE INTERNATIONAL CODE COUNCIL, INC., 4051 FLOSSMOOR ROAD, COUNTRY CLUB HILLS, IL 60478, ALONG WITH CERTAIN AMENDMENTS THERETO AND PROVIDING REMEDIES AND PENALTIES FOR THE VIOLATION THEREOF

SUMMARY:

Attached is an Ordinance which adopts the 2021 International Fire Code. It repeals the current Fire Code as codified in Chapter 2 of Title III of the Pueblo Municipal Code and replaces it with a new chapter to more closely track the rules and regulations as set out in the most current International Fire Code (I.F.C.).

PREVIOUS COUNCIL ACTION:

Article II of Title III (International Fire Code) was first adopted in 1957. Periodically, the City Council has adopted updated versions of the International Fire Code with minor amendments, most recently in 2015. The Council adopted the 2015 International Fire Code on July 13, 2015, by Ordinance No. 8900.

BACKGROUND:

The International Fire Code addresses life safety, fire prevention, fire protection and the safe storage and use of hazardous materials both on land and also within those new and existing buildings.

The proposed Ordinance adopts the 2021 International Fire Code with minor amendments to include some appendices which together shall regulate the minimum fire safety requirements for new and existing sites, buildings, facilities, storage, processes and practices within the jurisdiction. Adoption of this version of the

International Fire Code will align with those most recent adoptions of the following interconnected construction codes:

- 2021 International Building Code, 2021 International Energy Conservation Code, 2021 International Existing Building Code, (Ordinance No. 10466).
- 2021 International Mechanical Code, 2021 International Fuel and Gas Code, (Ordinance No. 10467).
- 2021 International Plumbing Code, 2021 International Residential Code, 2021 International Swimming Pool and Spa Code, (Ordinance No. 10684).

Adoption of this version avoids additional requirements that will apply if the Code is adopted on or after July 1, 2026.

This new revision will separate ordinances involving the Fire Department outside the I.F.C. into a different section to allow for easier revisions in the future such as offenses on burn restrictions and fees.

FINANCIAL IMPLICATIONS:

Adopting the code has no cost to City.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

A county wide group of fire officials, to include Pueblo City Fire, Pueblo West Fire, Pueblo Rural Fire, Rye Fire, Beulah Fire, Pueblo County Emergency Services Bureau, have met with members of the Southern Colorado Building Department, formally the Pueblo Regional Building Department, periodically over the past few years to review the codes and make recommendations on amendments in order to achieve the best possible consistency regarding code requirements for all our citizens throughout Pueblo County, the City of Pueblo and the combined Pueblo metropolitan areas.

Additionally, changes have been reviewed by the Director of Public Works.

ALTERNATIVES:

Failure to enact this Ordinance will result in the City continuing to operate under an outdated Fire Code. Not acting would also perpetuate a conflict between the adopted 2021 interconnected construction codes and our current Fire Code. This could result in the lowering of the Department's Insurance Services Office, Inc. ("ISO") rating.

RECOMMENDATION:

Approve the Ordinance.

ATTACHMENTS:

1. Ordinance
2. Ordinance (redlined)

ORDINANCE NO. _____

AN ORDINANCE REPEALING CHAPTER 2, TITLE III OF THE PUEBLO MUNICIPAL CODE RELATING TO AND ADOPTING A NEW CHAPTER 2, TITLE III OF THE 2021 INTERNATIONAL FIRE CODE PUBLISHED BY THE INTERNATIONAL CODE COUNCIL, INC., 4051 FLOSSMOOR ROAD, COUNTRY CLUB HILLS, IL 60478, ALONG WITH CERTAIN AMENDMENTS THERETO AND PROVIDING REMEDIES AND PENALTIES FOR THE VIOLATION THEREOF

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Title III of the Pueblo Municipal Code is hereby amended by the repeal of the current Chapter 2 and the enactment of the following new Chapter 2:

Article II - International Fire Code

Sec. 3-2-21. - Legislative findings; International Fire Code adoption by reference.

(a) Legislative findings.

(1) City Council hereby finds and declares that there are numerous fire, chemical and explosive risks within the City which affect or are likely to adversely affect public health, safety and welfare. To correct and prevent the existence of such adverse conditions and to achieve and maintain such levels of fire prevention and fire safety as will protect and promote public health, safety and welfare, the establishment and adoption of the 2021 International Fire Code is necessary.

(2) The purpose of this Chapter is to protect public health, safety and welfare from the adverse effects of fire, explosions and chemical spills.

(3) The 2021 International Fire Code provides reasonable and nationally recognized standards for fire prevention and safety.

(b) International Fire Code adopted by reference. The International Fire Code, 2021 Edition, including the appendices thereto, promulgated and published by the International Code Council, Inc., 4051 Flossmoor Road, Country Club Hills, IL, 60478, November 2020, hereinafter referred to as the International Fire Code (IFC), is hereby adopted and enacted by reference as the fire prevention code of the City; provided, however, that the following portions or provisions thereof are not hereby adopted: (a) the Preface, (b) the sample form of ordinance adopting the I.F.C., (c) Appendix A, Board of Appeals, (d) Appendix E, Hazard Categories, (e) Appendix G, Cryogenic Fluids, (f)

Appendix J, Building Information Sign, and (g) Appendix L, Requirements for Fire Fighter Air Replenishment Systems. Whenever this Code refers to the "International Fire Code" or "I.F.C.," the reference shall be taken to mean the International Fire Code, 2021 Edition, as adopted and amended in this Chapter.

(c) Copies of the I.F.C., 2021 Edition, are available in the office of the Fire Inspector for the City of Pueblo, 1551 Bonforte Blvd., Pueblo, CO, 81001 for distribution and sale to the public.

Sec. 3-2-22. - Division of Fire Prevention; establishment; supervisor.

Sections 103.1, 103.2, and 103.3 of the I.F.C. are amended as follows:

The International Fire Code and this Article II shall be enforced by the Division of Fire Prevention in the Fire Department of the City, which is hereby established and which shall be operated under the supervision of the Chief of the Fire Department. The Chief of the Fire Department may assign one (1) assistant or deputy chief as the head of the Division of Fire Prevention, and such other members of the Fire Department as inspectors from time to time as he or she shall deem necessary. The Chief, the head of the Division of Fire Prevention and such assigned inspectors shall be vested with the authority of a police officer with respect to the enforcement of this Article and the International Fire Code, including the authority to issue a summons and complaint for violation thereof.

Sec. 3-2-23. - Dual coverage; most restricted governs.

If any section or sections contained in the International Fire Code are also covered by a section or sections of the International Building Code, the National Electrical Code, or other International Code Council, as the same may be now or hereafter altered, amended or adopted, the most restricted provision or that imposing the highest standard shall govern. Section 102.7 is repealed.

Sec. 3-2-24 -Definitions.

(a) In General: Any reference to jurisdiction in the I.F.C. shall be the City of Pueblo, including Pueblo Memorial Airport, and Pueblo Mountain Park, any reference to agency, bureau or department shall refer to the City of Pueblo Fire Department. Any reference to the Code Official or Fire Code Official in the I.F.C. shall mean the Chief of the Fire Department and any inspector or Assistant or Deputy Chief as assigned by the Chief of the Fire Department. Any reference to codes outside of the I.F.C. refers to those codes adopted by the City of Pueblo.

(b) AGENCY. Wherever the word "agency" is used in the International Fire Code, it shall be held to mean the Division of Fire Prevention of the City of Pueblo Fire Department.

(c) DEPARTMENT. Wherever the words "department" are used in the International Fire Code, it shall be held to mean the City of Pueblo Fire Department.

(d) FIRE CODE OFFICIAL. Wherever the word "fire code official" is used in the International Fire Code, it shall be held to mean the Chief of the Fire Department or any Assistant Chief, Deputy City or Inspector as assigned by the Chief of the Fire Department.

(e) JURISDICTION. Wherever the word "jurisdiction" is used in the International Fire Code, it shall be held to mean the City of Pueblo and those areas outside the city limits but within Pueblo County for which the Pueblo City Fire Department is responsible.

(f) Section 202 General Definitions shall include the following definitions:

1. BONFIRE. An outdoor fire utilized for ceremonial purposes. An outdoor fire, greater than 3 feet in diameter and 2 feet in height, utilized for any religious, celebratory, or similar purpose.

2. EMERGENCY VEHICLE ACCESS. A continuous and unobstructed paved or otherwise approved way of ingress and egress from a public roadway to a development specifically intended for the use of emergency service vehicles and not the general public.

3. FLAME EFFECTS. The combustion of flammable solids, liquids, or gases to produce thermal, physical, visual, or audible phenomena before an audience.

Sec. 3-2-25. - Board of Appeals.

Section 111 of the International Fire Code as amended and adopted by the City is hereby deleted in its entirety and amended to read as follows:

(a) Any person aggrieved by any ruling, decision, interpretation or order of the Fire Chief, the Deputy or Assistant Fire Chief in charge of fire prevention or the Fire Department, shall have the right to appeal to the Fire Board of Appeals, which is hereby created.

(b) Board Membership: The Fire Board of Appeals shall consist of five (5) members who shall be qualified by experience or training in Pueblo fire safety or related matters. The Fire Chief shall be a nonvoting ex officio member and shall act as secretary of the Board. The Board of Appeals shall be appointed by the Mayor, subject to City Council confirmation, for such terms and upon such conditions as shall be set forth by the Mayor. The Board members shall serve at the pleasure of the Mayor.

(c) Rules of Proceedings: The Board shall adopt reasonable rules and regulations for conducting its proceedings and shall render all decisions and findings in writing to the Fire Chief, with a duplicate copy to the appellant, and may recommend to the Mayor such new legislation as the Board may deem necessary.

(d) Filing an Appeal: Any aggrieved person appealing any ruling, decision, interpretation or order shall file a written appeal setting forth the grounds and reasons for

such appeal with the Fire Chief within fourteen (14) days from the date of such ruling, interpretation, order or decision which is being appealed.

(e) Hearing: If such notice is timely filed, the Board of Appeals shall set a time and place for a hearing and, by first class mail, postage prepaid, notify the party filing the appeal. The date of the hearing shall be not more than twenty-one (21) days after the filing of the appeal. The hearing shall be open to the public and all interested persons shall be heard. The Board of Appeals, by majority vote of the members present, shall affirm, modify or reverse any appealed ruling, interpretation, order or decision of the Fire Chief, the Deputy or Assistant Fire Chief for fire prevention or the Fire Department. The Board of Appeals may permit a variance from the strict terms and provisions of this Chapter or the International Fire Code as adopted by the City in order to avoid extreme hardship, provided that such variance can be made without increasing the hazards to the health or safety of persons or property, and further provided that the granting of such variance will not violate the intent and purposes of the fire code. Mere inconvenience to the appellant shall not be grounds for the granting of a variance.

Sec. 3-2-26. - Additional modifications to the International Fire Code.

The following Sections or Subsections of the International Fire Code and Appendices thereto, as adopted by this Chapter, are amended as follows:

(1) Subsection 104.1.1 is amended to read as follows:

Subsection 104.1.1 Minimum standards. Where any provision of this code makes a reference to a “minimum” or “not less than” specification, to include any measurements, dimensions or distances; the fire code official is authorized to require, and shall have the authority to require, that those specifications be modified including increasing or enlargement when, given the attendant circumstance, the minimum standards do not meet the intent and purpose of this code, or would cause an unsafe condition.

(2) Subsection 105.5.16 is amended to include fireworks.

(3) Subsection 105.5.48 is amended to read as follows:

105.5.48 Storage of scrap tires and tire byproducts. An operational permit is required to establish, conduct or maintain storage of scrap tires and tire byproducts that exceeds 2,500 cubic feet (71 m^2) of total volume of scrap tires, and for indoor or outdoor storage of tires and tire byproducts.

(4) Subsection 107.2 is amended to read as follows:

107.2 Schedule of permit or related fees. Where a permit, plan review, inspection, service or activity is required, a fee for each of these shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

(5) Subsection 107.2.1 is amended to read as follows:

107.2.1 Fees established by resolution. The fees for operational permits, construction permits, plan review and all other services or activities performed by the Fire Department or the fire code official shall be established by resolution adopted by the City Council.

(6) Subsection 107.5.1 is amended to read as follows:

107.5.1 Plan review and inspection fees. Whenever an application for any building permit pursuant to the International Building Code or Chapter 2 of Title IV of the Pueblo Municipal Code requires plan review for compliance with the International Fire Code, or any inspection or reinspection by the fire code official, the applicant shall be required to pay a plan review and/or inspection fee to the City.

(7) Subsection 107.6 is amended to read as follows:

107.6 Fees prorated or refunded. Unless specifically provided otherwise in this fire prevention code or Title III of the Pueblo Municipal Code, no fee or charge shall be prorated or refunded.

(8) Subsection 109.3.1 is amended to read as follows:

109.3.1 Inspection, Test and Maintenance Records. All inspection, test, and maintenance reports to include repairs related to the requirements of this code shall be filed within 7 days of the system inspection, test, or maintenance. The reports shall be filed with an approved third-party agency designated by the *fire code official*, using the format and electronic filing system specified by the third-party filing service. Any filing and reporting costs will be the responsibility of the licensed submitting contractor. Failure to utilize the designated reporting system within 30 days may result in re-inspection fees, revocation of licensure, and/or a court summons to the fire protection contractor.

(9) Subsection 113.4 is amended to read as follows:

113.4 Failure to comply. It is unlawful for any person to continue, after having been served with a stop order that directs that person to perform or to remove a violation or unsafe condition. It is a Class one municipal offense for persons operating or maintaining an occupancy, premises, or vehicle subject to this code who allow a hazard to exist or fail to take immediate action to abate a hazard on such occupancy, premises, or vehicle when ordered or notified to do so by the code official.

(10) Subsection 113.5 is amended to read as follows:

113.5 Penalties. It is unlawful for any person to violate any of the provisions of this part including any provisions of the International Fire Code, International Fire Code Appendices, and International Fire Code Amendments, as adopted. All penalties are defined further in this code.

(11) Subsection 1101.1 is amended to read as follows:

1101.1 Scope. The provisions of this chapter shall apply to existing buildings constructed prior to the adoption of this code. Except that if an existing building contains in whole or in part, an Ambulatory Care Facility, the provisions of Appendix K, as adopted, shall also apply.

(12) Paragraph 1 of Subsection 3103.2 is amended to read as follows:

3103.2 Approval Required. Tents and membrane structures having a tent or membrane surface area in excess of 600 square feet (56 m^2) or having an occupancy of more than fifty (50) persons shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the fire code official.

(13) Subsection D101.1 of Appendix D is amended to read as follows:

D101.1.1 Road design and construction. approved fire apparatus access roads shall be in accordance with this appendix and/or the most recent Roadway Classification Design Standards and Policies adopted by City Council pursuant to the authority of Section 12-4-7 of the Pueblo Municipal Code, as amended. Where, in any specific case, different material, methods of construction or other requirements are specified, the most restrictive shall apply/govern.

Sec. 3-2-27. - Responsibility for damages; liability of City.

(a) The provisions of this Chapter and the I.F.C. shall neither release nor discharge any person from any liability imposed by law for any injury to persons or damage to property caused by or resulting from the performance or failure to perform work or furnishing materials covered by this Chapter.

(b) Nothing in this Chapter or the I.F.C. is intended to create any duty upon the City, the Pueblo Fire Department or either of their agents or employees. Neither the City nor any of its agents or employees will be held liable for any injury to persons or damage to property by reason of any act or failure to perform any act authorized or required by this Chapter or the I.F.C.

Sec. 3-2-28. - Unlawful conduct and criminal penalties; revocation of permits; other enforcement.

(a) Subsection 112.1 is amended to read as follows:

112.1 Unlawful acts. It shall be unlawful, and a Class one municipal offense, for a person, firm or corporation to erect, construct, alter, repair, remove, demolish or utilize a building, occupancy, premises or system regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.

(b) Subsection 112.4 is amended to read as follows:

112.4 Violation penalties. Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter, repair or do work in violation of the *approved construction documents* or directive of the fire code official, or of a permit or certificate used under provisions of this code, shall be guilty of a

Class one municipal offense. Each day that a violation continues after due notice has been served shall be deemed a separate offense.

(c) Subsection 112.4.1 is amended to read as follows:

112.4.1 Abatement of violation. In addition to the imposition of the penalties herein described, the *fire code official* is authorized to institute appropriate action to prevent unlawful construction or to restrain, correct or abate a violation; or to prevent illegal occupancy of a structure or premises; or to stop an illegal act, conduct of business or occupancy of a structure on or about any premises.

(d) It shall be unlawful for any person to knowingly violate, disobey, omit, neglect, refuse or fail to comply with or resist the enforcement of any provision of this Chapter or of the International Fire Code.

(e) It shall be unlawful for any person to refuse or fail to timely comply with any order issued by the Chief of the Fire Department, the head of the Division of Fire Prevention or other designated fire inspector pursuant to the provisions of this Chapter or the International Fire Code.

(f) It shall be unlawful for any person to knowingly make any false statement, representation or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to any requirement of this Chapter or the International Fire Code.

(g) Any permit issued pursuant to the provisions of this Chapter or the International Fire Code may be suspended, terminated or revoked by the Chief of the Fire Department for:

(1) Any of the reasons stated in Section 105 of the International Fire Code; or

(2) Any material violation of the terms of said permit or requirements applicable thereto. In addition, the Chief may immediately suspend any permit issued pursuant to Title III of the Pueblo Municipal Code upon the arrest of any permittee or any agent or employee of such permittee for possession of fireworks with intent to sell or offer to sell the same.

(h) In the event any owner or occupant of premises within the City shall refuse entry to the Chief or any fire inspector, or if any premises are locked and the Chief or any fire inspector has been unable to obtain permission of the owner or occupant to enter, the Municipal Court is authorized to issue a search warrant authorizing such entry in accordance with the procedures set forth in the Colorado Municipal Court Rules.

(i) In the event that any owner or occupant of premises within the City, or any licensee or permittee, shall fail or refuse to comply with any provision of this Chapter, the International Fire Code or any license or permit issued thereunder, the City may initiate

an action for injunctive relief in any court of competent jurisdiction to compel compliance with said Chapter, International Fire Code, license or permit.

(j) The enforcement remedies set forth in this Section and in Section 112 of the International Fire Code are hereby expressly declared to be cumulative, and the exercise of any one (1) or more of them is not dependent upon the exercise of any other remedy, nor does the exercise of any one (1) or more of them constitute any bar or limitation to the exercise of any other.

(k) All violations of this code are Class one municipal offense unless otherwise specified. Violations of this Article II of Chapter 2 of Title III are a public nuisance.

SECTION 2.

The officers and staff of the City are authorized and directed to perform any and all acts consistent with the intent of this Ordinance to effectuate the policies and procedures described herein.

SECTION 3.

This Ordinance shall become effective thirty (30) days following final passage.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on_____

☐ Council action on _____failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

ORDINANCE NO. _____

AN ORDINANCE REPEALING CHAPTER 2, TITLE III OF THE PUEBLO MUNICIPAL CODE RELATING TO AND ADOPTING A NEW CHAPTER 2, TITLE III OF THE 2021 INTERNATIONAL FIRE CODE PUBLISHED BY THE INTERNATIONAL CODE COUNCIL, INC., 4051 FLOSSMOOR ROAD, COUNTRY CLUB HILLS, IL 60478, ALONG WITH CERTAIN AMENDMENTS THERETO AND PROVIDING REMEDIES AND PENALTIES FOR THE VIOLATION THEREOF

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Title III of the Pueblo Municipal Code is hereby amended by the repeal of the current Chapter 2 and the enactment of the following new Chapter 2:

Article II - International Fire Code

Sec. 3-2-21. - Legislative findings; International Fire Code adoption by reference.

(a) Legislative findings.

(1) City Council hereby finds and declares that there are numerous fire, chemical and explosive risks within the City which affect or are likely to adversely affect public health, safety and welfare. To correct and prevent the existence of such adverse conditions and to achieve and maintain such levels of fire prevention and fire safety as will protect and promote public health, safety and welfare, the establishment and adoption of the 2021 International Fire Code is necessary.

(2) The purpose of this Chapter is to protect public health, safety and welfare from the adverse effects of fire, explosions and chemical spills.

(3) The 2021 International Fire Code provides reasonable and nationally recognized standards for fire prevention and safety.

(b) International Fire Code adopted by reference. The International Fire Code, 2021 Edition, including the appendices thereto, promulgated and published by the International Code Council, Inc., 4051 Flossmoor Road, Country Club Hills, IL, 60478, November 2020, hereinafter referred to as the International Fire Code (IFC), is hereby adopted and enacted by reference as the fire prevention code of the City; provided, however, that the following portions or provisions thereof are not hereby adopted: (a) the Preface, (b) the sample form of ordinance adopting the I.F.C., (c) Appendix A, Board of Appeals, (d) Appendix E, Hazard Categories, (e) Appendix G, Cryogenic Fluids, (f)

Appendix J, Building Information Sign, and (g) Appendix L, Requirements for Fire Fighter Air Replenishment Systems. Whenever this Code refers to the "International Fire Code" or "I.F.C.," the reference shall be taken to mean the International Fire Code, 2021 Edition, as adopted and amended in this Chapter.

(c) Copies of the I.F.C., 2021 Edition, are available in the office of the Fire Inspector for the City of Pueblo, 1551 Bonforte Blvd., Pueblo, CO, 81001 for distribution and sale to the public.

Sec. 3-2-22. - Division of Fire Prevention; establishment; supervisor.

Sections 103.1, 103.2, and 103.3 of the I.F.C. are amended as follows:

> The International Fire Code and this Article II shall be enforced by the Division of Fire Prevention in the Fire Department of the City, which is hereby established and which shall be operated under the supervision of the Chief of the Fire Department. The Chief of the Fire Department may assign one (1) assistant or deputy chief as the head of the Division of Fire Prevention, and such other members of the Fire Department as inspectors from time to time as he or she shall deem necessary. The Chief, the head of the Division of Fire Prevention and such assigned inspectors shall be vested with the authority of a police officer with respect to the enforcement of this Article and the International Fire Code, including the authority to issue a summons and complaint for violation thereof.

Sec. 3-2-23. - Dual coverage; most restricted governs.

If any section or sections contained in the International Fire Code are also covered by a section or sections of the International Building Code, the National Electrical Code, or other International Code Council, as the same may be now or hereafter altered, amended or adopted, the most restricted provision or that imposing the highest standard shall govern. Section 102.7 is repealed.

Sec. 3-2-24 -Definitions.

(a) In General: Any reference to jurisdiction in the I.F.C. shall be the City of Pueblo, including Pueblo Memorial Airport, and Pueblo Mountain Park, any reference to agency, bureau or department shall refer to the City of Pueblo Fire Department. Any reference to the Code Official or Fire Code Official in the I.F.C. shall mean the Chief of the Fire Department and any inspector or Assistant or Deputy Chief as assigned by the Chief of the Fire Department. Any reference to codes outside of the I.F.C. refers to those codes adopted by the City of Pueblo.

(b) AGENCY. Wherever the word "agency" is used in the International Fire Code, it shall be held to mean the Division of Fire Prevention of the City of Pueblo Fire Department.

(c) DEPARTMENT. Wherever the words "department" are used in the International Fire Code, it shall be held to mean the City of Pueblo Fire Department.

(d) FIRE CODE OFFICIAL. Wherever the word "fire code official" is used in the International Fire Code, it shall be held to mean the Chief of the Fire Department or any Assistant Chief, Deputy City or Inspector as assigned by the Chief of the Fire Department.

(e) JURISDICTION. Wherever the word "jurisdiction" is used in the International Fire Code, it shall be held to mean the City of Pueblo and those areas outside the city limits but within Pueblo County for which the Pueblo City Fire Department is responsible.

(f) Section 202 General Definitions shall include the following definitions:

1. BONFIRE. An outdoor fire utilized for ceremonial purposes. An outdoor fire, greater than 3 feet in diameter and 2 feet in height, utilized for any religious, celebratory, or similar purpose.

2. EMERGENCY VEHICLE ACCESS. A continuous and unobstructed paved or otherwise approved way of ingress and egress from a public roadway to a development specifically intended for the use of emergency service vehicles and not the general public.

3. FLAME EFFECTS. The combustion of flammable solids, liquids, or gases to produce thermal, physical, visual, or audible phenomena before an audience.

Sec. 3-2-25. - Board of Appeals.

Section 111 of the International Fire Code as amended and adopted by the City is hereby deleted in its entirety and amended to read as follows:

(a) Any person aggrieved by any ruling, decision, interpretation or order of the Fire Chief, the Deputy or Assistant Fire Chief in charge of fire prevention or the Fire Department, shall have the right to appeal to the Fire Board of Appeals, which is hereby created.

(b) Board Membership: The Fire Board of Appeals shall consist of five (5) members who shall be qualified by experience or training in Pueblo fire safety or related matters. The Fire Chief shall be a nonvoting ex officio member and shall act as secretary of the Board. The Board of Appeals shall be appointed by the Mayor, subject to City Council confirmation, for such terms and upon such conditions as shall be set forth by the Mayor. The Board members shall serve at the pleasure of the Mayor.

(c) Rules of Proceedings: The Board shall adopt reasonable rules and regulations for conducting its proceedings and shall render all decisions and findings in writing to the Fire Chief, with a duplicate copy to the appellant, and may recommend to the Mayor such new legislation as the Board may deem necessary.

(d) Filing an Appeal: Any aggrieved person appealing any ruling, decision, interpretation or order shall file a written appeal setting forth the grounds and reasons for

such appeal with the Fire Chief within fourteen (14) days from the date of such ruling, interpretation, order or decision which is being appealed.

(e) Hearing: If such notice is timely filed, the Board of Appeals shall set a time and place for a hearing and, by first class mail, postage prepaid, notify the party filing the appeal. The date of the hearing shall be not more than twenty-one (21) days after the filing of the appeal. The hearing shall be open to the public and all interested persons shall be heard. The Board of Appeals, by majority vote of the members present, shall affirm, modify or reverse any appealed ruling, interpretation, order or decision of the Fire Chief, the Deputy or Assistant Fire Chief for fire prevention or the Fire Department. The Board of Appeals may permit a variance from the strict terms and provisions of this Chapter or the International Fire Code as adopted by the City in order to avoid extreme hardship, provided that such variance can be made without increasing the hazards to the health or safety of persons or property, and further provided that the granting of such variance will not violate the intent and purposes of the fire code. Mere inconvenience to the appellant shall not be grounds for the granting of a variance.

Sec. 3-2-26. - Additional modifications to the International Fire Code.

The following Sections or Subsections of the International Fire Code and Appendices thereto, as adopted by this Chapter, are amended as follows:

(1) Subsection 104.1.1 is amended to read as follows:

Subsection 104.1.1 Minimum standards. Where any provision of this code makes a reference to a “minimum” or “not less than” specification, to include any measurements, dimensions or distances; the fire code official is authorized to require, and shall have the authority to require, that those specifications be modified including increasing or enlargement when, given the attendant circumstance, the minimum standards do not meet the intent and purpose of this code, or would cause an unsafe condition.

(2) Subsection 105.2 is amended to read as follows:

105.2 Application. Application for permit required by this code shall be made to the fire code official in such form and detail as prescribed by the fire code official. Applications for permits shall be accompanied by such plans as prescribed by the fire code official, and payment of the application fee.

(3) Subsection 105.5 is amended to read as follows:

105.5 Required operational permits. The fire code official is authorized to issue operational permits for the operations set forth in Sections 105.1.1 through 105.5.52.

~~(2)~~(4) Subsection 105.5.16 is amended to read as follows: ~~include fireworks.~~

105.5.16 Explosives and fireworks. An operational permit is required for the manufacture, storage, handling, sale or use of any quantity of explosive, explosive materials, fireworks or pyrotechnic special effects with the scope of Chapter 56.

(5) Subsection 105.5.36 is amended to read as follows:

105.5.36 Open flames and candles. An operational permit is required to use open flames or candles in connection with assembly areas, dining areas of restaurants, drinking establishments, or to use open flame effects.

~~(3)~~(6) Subsection 105.5.48 is amended to read as follows:

105.5.48 Storage of scrap tires and tire byproducts. An operational permit is required to establish, conduct or maintain storage of scrap tires and tire byproducts that exceeds 2,500 cubic feet (71 m^{23}) of total volume of scrap tires, and for indoor or outdoor storage of tires and tire byproducts.

(7) Subsection 105.5.49 is amended to read as follows:

105.5.49 Temporary membrane structures and tents. An operational permit is required to operate an air-supported temporary membrane structure, a temporary special event structure or a tent having an area in excess of 600 square feet (56 m^2).

(8) Subsection 105.6.24 is amended to read as follows:

105.6.24 Temporary membrane structures and tents. A construction permit is required to operate an air-supported temporary membrane structure, a temporary special event structure or a tent having an area in excess of 600 square feet (56 m^2).

~~(4)~~(9) Subsection 107.2 is amended to read as follows:

107.2 Schedule of permit or related fees. Where a permit, plan review, inspection, service or activity is required, a fee for each of these shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

~~(5)~~(10) Subsection 107.2.1 is ~~amended~~ added to read as follows:

107.2.1 Fees established by resolution. The fees for operational permits, construction permits, plan review and all other services or activities performed by the Fire Department or the fire code official shall be established by resolution adopted by the City Council.

~~(6)~~(11) Subsection 107.5.1 is ~~amended~~ added to read as follows:

107.5.1 Plan review and inspection fees. Whenever an application for any building permit pursuant to the International Building Code or Chapter 2 of Title IV of the Pueblo Municipal Code requires plan review for compliance with the International Fire Code, or any inspection or reinspection by the fire code official, the applicant shall be required to pay a plan review and/or inspection fee to the City.

~~(7)~~(12) Subsection 107.6 is amended to read as follows:

107.6 Fees prorated or refunded. Unless specifically provided otherwise in this fire prevention code or Title III of the Pueblo Municipal Code, no fee or charge shall be prorated or refunded.

~~(8)~~(13) Subsection 109.3.1 is ~~amended~~ added to read as follows:

109.3.1 Inspection, Test and Maintenance Records. All inspection, test, and maintenance reports to include repairs related to the requirements of this code shall be filed within 7 days of the system inspection, test, or maintenance. The reports shall be filed with an approved third-party agency designated by the *fire code official*, using the format and electronic filing system specified by the third-party filing service. Any filing and reporting costs will be the responsibility of the licensed submitting contractor. Failure to utilize the designated reporting system within 30 days may result in re-inspection fees, revocation of licensure, and/or a court summons to the fire protection contractor.

~~(9)~~(14) Subsection 113.4 is amended to read as follows:

113.4 Failure to comply. It is unlawful for any person to continue, after having been served with a stop order that directs that person to perform or to remove a violation or unsafe condition. It is a Class one municipal offense for persons operating or maintaining an occupancy, premises, or vehicle subject to this code who allow a hazard to exist or fail to take immediate action to abate a hazard on such occupancy, premises, or vehicle when ordered or notified to do so by the code official.

~~(10)~~(15) Subsection 113.5 is ~~amended~~ added to read as follows:

113.5 Penalties. It is unlawful for any person to violate any of the provisions of this part including any provisions of the International Fire Code, International Fire Code Appendices, and International Fire Code Amendments, as adopted. All penalties are defined further in this code.

(16) Subsection 407.5 is amended to read as follows:

407.5 Hazardous Materials Inventory Statement. Where required by the fire code official, each application for a permit shall include a Hazardous Materials Inventory Statement (HMIS) in accordance with Section 5001.5.2 or as provided in Appendix H, as adopted.

(17) Subsection 407.6 is amended to read as follows:

407.6 Hazardous Materials Management Plan. Where required by the fire code official, each application for a permit shall include a Hazardous Materials Management Plan (HMMP) in accordance with Section 5001.5.1 or as provided in Appendix H, as adopted.

(18) Subsection 503.1 is amended to read as follows:

503.1 Where required. Fire apparatus access roads shall be designed, provided and maintained in accordance with Sections 503.1.1 through 503.6, and Appendix D as adopted and amended.

(19) Subsection 504.1 is amended to read as follows:

504.1 Required access. Exterior doors and openings required by this code, the International Residential Code or the International Building Code shall be maintained readily accessible for emergency access by the fire department, or other emergency response agency. An approved access walkway leading from fire apparatus access roads to exterior openings shall be provided where required by the fire code official.

(20) Subsection 507.1 is amended to read as follows:

507.1 Required water supply. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises on which facilities, buildings or portions of buildings are hereafter constructed, moved, or annexed into or within the jurisdiction.

(21) Subsection 507.3 is amended to read as follows:

507.3 Fire Flow. Fire-flow requirements for buildings or portions of buildings and facilities shall be determined in accordance with Appendix B as adopted.

(22) Subsection 507.5 is amended to read as follows:

507.5 Fire hydrant system. Fire hydrant systems shall comply with Sections 507.5.1 through 507.5.6, NFPA 24 and Appendix C as adopted.

~~(11)~~(23) Subsection 1101.1 is amended to read as follows:

1101.1 Scope. The provisions of this chapter shall apply to existing buildings constructed prior to the adoption of this code. Except that if an existing building contains, in whole or in part, an Ambulatory Care Facility, the provisions of Appendix K, as adopted, shall also apply.

~~(12)~~(24) Paragraph 1 of Subsection 3103.2 is amended to read as follows:

3103.2 Approval Required. Tents and membrane structures having a tent or membrane surface area in excess of 600 square feet (56 m^2) or having an occupancy of more than fifty (50) persons shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the fire code official.

~~(13)~~(25) Subsection D101.1 of Appendix D is ~~amended~~ added to read as follows:

D101.1.1 Road design and construction. approved fire apparatus access roads shall be in accordance with this appendix and/or the most recent Roadway Classification Design Standards and Policies adopted by City Council pursuant to the authority of Section 12-4-7 of the Pueblo Municipal Code, as amended. Where, in any specific case, different material, methods of construction or other requirements are specified, the most restrictive shall apply/govern.

Sec. 3-2-27. - Responsibility for damages; liability of City.

(a) The provisions of this Chapter and the I.F.C. shall neither release nor discharge any person from any liability imposed by law for any injury to persons or damage to property caused by or resulting from the performance or failure to perform work or furnishing materials covered by this Chapter.

(b) Nothing in this Chapter or the I.F.C. is intended to create any duty upon the City, the Pueblo Fire Department or either of their agents or employees. Neither the City nor any of its agents or employees will be held liable for any injury to persons or damage to property by reason of any act or failure to perform any act authorized or required by this Chapter or the I.F.C.

Sec. 3-2-28. - Unlawful conduct and criminal penalties; revocation of permits; other enforcement.

(a) Subsection 112.1 is amended to read as follows:

112.1 Unlawful acts. It shall be unlawful, and a Class one municipal offense, for a person, firm or corporation to erect, construct, alter, repair, remove, demolish or utilize a building, occupancy, premises or system regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.

(b) Subsection 112.4 is amended to read as follows:

112.4 Violation penalties. Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter, repair or do work in violation of the *approved construction documents* or directive of the fire code official, or of a permit or certificate used under provisions of this code, shall be guilty of a Class one municipal offense. Each day that a violation continues after due notice has been served shall be deemed a separate offense.

(c) Subsection 112.4.1 is amended to read as follows:

112.4.1 Abatement of violation. In addition to the imposition of the penalties herein described, the *fire code official* is authorized to institute appropriate action to prevent unlawful construction or to restrain, correct or abate a violation; or to prevent illegal occupancy of a structure or premises; or to stop an illegal act, conduct of business or occupancy of a structure on or about any premises.

(d) It shall be unlawful for any person to knowingly violate, disobey, omit, neglect, refuse or fail to comply with or resist the enforcement of any provision of this Chapter or of the International Fire Code.

(e) It shall be unlawful for any person to refuse or fail to timely comply with any order issued by the Chief of the Fire Department, the head of the Division of Fire Prevention or other designated fire inspector pursuant to the provisions of this Chapter or the International Fire Code.

(f) It shall be unlawful for any person to knowingly make any false statement, representation or certification in any application, record, report, plan or other document

filed or required to be maintained pursuant to any requirement of this Chapter or the International Fire Code.

(g) Any permit issued pursuant to the provisions of this Chapter or the International Fire Code may be suspended, terminated or revoked by the Chief of the Fire Department for:

(1) Any of the reasons stated in Section 105 of the International Fire Code; or

(2) Any material violation of the terms of said permit or requirements applicable thereto. In addition, the Chief may immediately suspend any permit issued pursuant to Title III of the Pueblo Municipal Code upon the arrest of any permittee or any agent or employee of such permittee for possession of fireworks with intent to sell or offer to sell the same.

(h) In the event any owner or occupant of premises within the City shall refuse entry to the Chief or any fire inspector, or if any premises are locked and the Chief or any fire inspector has been unable to obtain permission of the owner or occupant to enter, the Municipal Court is authorized to issue a search warrant authorizing such entry in accordance with the procedures set forth in the Colorado Municipal Court Rules.

(i) In the event that any owner or occupant of premises within the City, or any licensee or permittee, shall fail or refuse to comply with any provision of this Chapter, the International Fire Code or any license or permit issued thereunder, the City may initiate an action for injunctive relief in any court of competent jurisdiction to compel compliance with said Chapter, International Fire Code, license or permit.

(j) The enforcement remedies set forth in this Section and in Section 112 of the International Fire Code are hereby expressly declared to be cumulative, and the exercise of any one (1) or more of them is not dependent upon the exercise of any other remedy, nor does the exercise of any one (1) or more of them constitute any bar or limitation to the exercise of any other.

(k) All violations of this code are Class one municipal offense unless otherwise specified. Violations of this Article II of Chapter 2 of Title III are a public nuisance.

SECTION 2.

The officers and staff of the City are authorized and directed to perform any and all acts consistent with the intent of this Ordinance to effectuate the policies and procedures described herein.

SECTION 3.

This Ordinance shall become effective thirty (30) days following final passage.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____
_____
_____
_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on_____

☐ Council action on _____failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Carla Sikes, City Attorney

SUBJECT: AN ORDINANCE APPROVING AND ACCEPTING THE CONVEYANCE OF TWO PARCELS OF REAL PROPERTY LOCATED AT 350 KEELER PARKWAY AND 442 KEELER PARKWAY FROM PUEBLO DEVELOPMENT FOUNDATION TO THE CITY OF PUEBLO, APPROVING A RELEASE OF DEED OF TRUST FOR EACH PROPERTY AND AUTHORIZING THE MAYOR TO EXECUTE THE SAME

SUMMARY:

Attached is an Ordinance accepting the conveyance of two parcels of real property located at 350 Keeler Parkway and 442 Keeler Parkway, located in the Airport Industrial Park, from Pueblo Development Foundation to the City of Pueblo, approving a Release of Deed of Trust for each property, and authorizing the Mayor to execute each Release of Deed of Trust.

PREVIOUS COUNCIL ACTION:

On May 10, 2021, by Ordinance No. 9926, City Council approved two Real Property Conveyance Agreements with Pueblo Development Foundation ("PDF") which transferred the real properties located at 350 Keeler Parkway and 442 Keeler Parkway in the Airport Industrial Park from the City to PDF.

BACKGROUND:

On May 10, 2021, City Council transferred two parcels of real property located at 350 Keeler Parkway and 442 Keeler Parkway within the Airport Industrial Park (the "Properties") to the Pueblo Development Foundation ("PDF") pursuant to two separate Conveyance Agreements each dated May 10, 2021. The Conveyance Agreements were part of an economic development transaction and related to an Employment Agreement with Transportation Technology Center, Inc. ("TTCI").

The Conveyance Agreements provided PDF would hold and manage the Properties for

the benefit of the City. PDF was required to lease the Properties to TTCI and upon termination of the leases convey the Properties back to the City. PDF leased the properties to TTCI for the benefit of the City. The lease agreements expire on June 30, 2026. TTCI has fulfilled all the requirements of its 2021 Employment Agreement and PDF no longer desires to manage the Properties. The City has negotiated a new economic development incentive package with TTCI which is or will be before City Council for consideration. The City must own the Properties to accomplish the new incentive package with TTCI.

FINANCIAL IMPLICATIONS:

None.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.If this Ordinance is not approved, the City will not regain ownership of the Properties.

ALTERNATIVES:

If this Ordinance is not approved, the City will not regain ownership of the Properties.

RECOMMENDATION:

Staff recommends approval.

ATTACHMENTS:

1. Release of Deed of Trust -- 350 Keeler Pkwy
2. Release of Deed of Trust -- 442 Keeler Pkwy
3. Special Warranty Deed -- 350 Keeler Pkwy
4. Special Warranty Deed -- 442 Keeler Pkwy

ORDINANCE NO.

AN ORDINANCE APPROVING AND ACCEPTING THE CONVEYANCE OF TWO PARCELS OF REAL PROPERTY LOCATED AT 350 KEELER PARKWAY AND 442 KEELER PARKWAY FROM PUEBLO DEVELOPMENT FOUNDATION TO THE CITY OF PUEBLO, APPROVING A RELEASE OF DEED OF TRUST FOR EACH PROPERTY AND AUTHORIZING THE MAYOR TO EXECUTE THE SAME

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The Special Warranty Deed dated June 30, 2026, from Pueblo Development Foundation conveying the real property located at 350 Keeler Parkway, Pueblo, Colorado 81001 to the City of Pueblo, a copy of which is attached hereto and incorporated herein by this reference, is hereby approved and accepted.

SECTION 2.

The Special Warranty Deed dated June 30, 2026, from the Pueblo Development Foundation conveying real property located at 442 Keeler Parkway, Pueblo, Colorado 81001 to the City of Pueblo, a copy of which is attached hereto and incorporated herein by this reference, is hereby approved and accepted.

SECTION 3.

The Mayor is authorized to execute the attached Release of Deed of Trust for the real property located at 350 Keeler Parkway, a copy of which is attached hereto and incorporated herein by this reference, having been approved as to form by the City Attorney, and deliver the same to the Public Trustee of the County of Pueblo, Colorado for recording in the real property records.

SECTION 4.

The Mayor is authorized to execute the attached Release of Deed of Trust for the real property located at 442 Keeler Parkway, a copy of which is attached hereto and incorporated herein by this reference, having been approved as to form by the City Attorney, and deliver the same to the Public Trustee of the County of Pueblo, Colorado for recording in the real property records.

SECTION 5.

The officers and staff of the City are authorized to perform any and all acts

consistent with this Ordinance which are necessary or appropriate to implement the transactions described therein.

SECTION 6.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____
_____
_____
_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Original Note and Deed of Trust Returned to:
WHEN RECORDED RETURN TO: City of Pueblo Law Department, 101 W. Riverwalk Place, 4th Floor, Pueblo, CO 81003
Prepared/Received by: City of Pueblo Law Department

REQUEST FOR FULL [X] / PARTIAL [ ]
RELEASE OF DEED OF TRUST AND RELEASE BY HOLDER OF THE EVIDENCE OF DEBT WITH PRODUCTION OF EVIDENCE OF DEBT PURSUANT TO § 38-39-102 (1) (a), COLORADO REVISED STATUTES

June 30, 2026	Date
Pueblo Development Foundation	Original Grantor (Borrower)
301 N. Main St., Suite 200, Pueblo, CO 81003	Current Address of Original Grantor, Assuming Party, or Current Owner
[ ] Check here if current address is unknown	
City of Pueblo, Colorado, a Colorado municipal corporation	Original Beneficiary (Lender)
July 1, 2021	Date of Deed of Trust
March 15, 2022	Date of Recording and/or Re-Recording of Deed of Trust
Reception No. 2268581	Recording Information

County Rcpt. No. and/or Film No. and/or Book/Page No. and/or Torrens Reg. No.

TO THE PUBLIC TRUSTEE OF Pueblo COUNTY (The County of the Public Trustee who is the appropriate grantee to whom the above Deed of Trust should grant an interest in the property described in the Deed of Trust.)

PLEASE EXECUTE AND RECORD A RELEASE OF THE DEED OF TRUST DESCRIBED ABOVE. The indebtedness secured by the Deed of Trust has been fully or partially paid and/or the purpose of the Deed of Trust has been fully or partially satisfied in regard to the property encumbered by the Deed of Trust as described therein as to a full release or, in the event of a partial release, only that portion of the real property described as: ***(IF NO LEGAL DESCRIPTION IS LISTED THIS WILL BE DEEMED A FULL RELEASE)***

City of Pueblo, Colorado, One City Hall Place, 2nd Floor, Pueblo, CO 81003
Name and Address of Current Holder of the Evidence of Debt Secured by Deed of Trust (Lender)

Heather Graham, Mayor, One City Hall Place, 2nd Floor, Pueblo, CO 81003
Name, Title and Address of Officer, Agent, or Attorney of Current Holder

Signature

Signature

State of Colorado , County of Pueblo
The foregoing Request for Release was acknowledged before me on June , 2026 (date) by*
Heather Graham, Mayor of the City of Pueblo, Colorado

(Notary seal)

Date Commission Expires

*If applicable, insert title of officer and name of current holder

Notary Public

Witness my hand and official seal

RELEASE OF DEED OF TRUST

WHEREAS, the Grantor(s) named above, by Deed of Trust, granted certain real property described in the Deed of Trust to the Public Trustee of the County referenced above, in the State of Colorado, to be held in trust to secure the payment of the indebtedness referred to therein; and

WHEREAS, the indebtedness secured by the Deed of Trust has been fully or partially paid and/or the purpose of the Deed of Trust has been fully or partially satisfied according to the written request of the current holder of the evidence of debt;

NOW THEREFORE, in consideration of the premises and the payment of the statutory sum, receipt of which is hereby acknowledged, I, as the Public Trustee in the County named above, do hereby fully and absolutely release, cancel and forever discharge the Deed of Trust or that portion of the real property described above in the Deed of Trust, together with all privileges and appurtenances thereto belonging.

(Public Trustee use only; use appropriate label)

(Public Trustee's Seal)

Public Trustee Date

Deputy Public Trustee Date

(If applicable: Notary Seal)

(If applicable, Name and Address of Person Creating New Legal Description as Required by § 38-35-106.5, Colorado Revised Statutes.)

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Rev. 09/09

Original Note and Deed of Trust Returned to:
WHEN RECORDED RETURN TO: City of Pueblo Law Department, 101 W. Riverwalk Place, 4th Floor, Pueblo, CO 81003
Prepared/Received by: City of Pueblo Law Department

REQUEST FOR FULL [X] / PARTIAL [ ]
RELEASE OF DEED OF TRUST AND RELEASE BY HOLDER OF THE EVIDENCE OF DEBT WITH PRODUCTION OF EVIDENCE OF DEBT PURSUANT TO § 38-39-102 (1) (a), COLORADO REVISED STATUTES

June 30, 2026	Date
Pueblo Development Foundation	Original Grantor (Borrower)
301 N. Main St., Suite 200, Pueblo, CO 81003	Current Address of Original Grantor, Assuming Party, or Current Owner
[ ] Check here if current address is unknown	
City of Pueblo, Colorado, a Colorado municipal corporation	Original Beneficiary (Lender)
July 1, 2021	Date of Deed of Trust
March 15, 2022	Date of Recording and/or Re-Recording of Deed of Trust
Reception No. 2268580	Recording Information

County Rcpt. No. and/or Film No. and/or Book/Page No. and/or Torrens Reg. No.

TO THE PUBLIC TRUSTEE OF Pueblo COUNTY (The County of the Public Trustee who is the appropriate grantee to whom the above Deed of Trust should grant an interest in the property described in the Deed of Trust.)

PLEASE EXECUTE AND RECORD A RELEASE OF THE DEED OF TRUST DESCRIBED ABOVE. The indebtedness secured by the Deed of Trust has been fully or partially paid and/or the purpose of the Deed of Trust has been fully or partially satisfied in regard to the property encumbered by the Deed of Trust as described therein as to a full release or, in the event of a partial release, only that portion of the real property described as: ***(IF NO LEGAL DESCRIPTION IS LISTED THIS WILL BE DEEMED A FULL RELEASE)***

City of Pueblo, Colorado, One City Hall Place, 2nd Floor, Pueblo, CO 81003
Name and Address of Current Holder of the Evidence of Debt Secured by Deed of Trust (Lender)

Heather Graham, Mayor, One City Hall Place, 2nd Floor, Pueblo, CO 81003
Name, Title and Address of Officer, Agent, or Attorney of Current Holder

Signature

Signature

State of Colorado , County of Pueblo
The foregoing Request for Release was acknowledged before me on June , 2026 (date) by*
Heather Graham, Mayor of the City of Pueblo, Colorado

(Notary seal)

Date Commission Expires

*If applicable, insert title of officer and name of current holder

Notary Public

Witness my hand and official seal

RELEASE OF DEED OF TRUST

WHEREAS, the Grantor(s) named above, by Deed of Trust, granted certain real property described in the Deed of Trust to the Public Trustee of the County referenced above, in the State of Colorado, to be held in trust to secure the payment of the indebtedness referred to therein; and

WHEREAS, the indebtedness secured by the Deed of Trust has been fully or partially paid and/or the purpose of the Deed of Trust has been fully or partially satisfied according to the written request of the current holder of the evidence of debt;

NOW THEREFORE, in consideration of the premises and the payment of the statutory sum, receipt of which is hereby acknowledged, I, as the Public Trustee in the County named above, do hereby fully and absolutely release, cancel and forever discharge the Deed of Trust or that portion of the real property described above in the Deed of Trust, together with all privileges and appurtenances thereto belonging.

(Public Trustee use only; use appropriate label)

(Public Trustee's Seal)

Public Trustee Date

Deputy Public Trustee Date

(If applicable: Notary Seal)

(If applicable, Name and Address of Person Creating New Legal Description as Required by § 38-35-106.5, Colorado Revised Statutes.)

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Rev. 09/09

SPECIAL WARRANTY DEED
(350 KEELER PARKWAY, PUEBLO, CO 81001)

THIS DEED, made, effective for all purposes on the 30th day of June, 2026 by and between the PUEBLO DEVELOPMENT FOUNDATION, a Colorado nonprofit corporation, Grantor, for and in consideration of the sum of TEN DOLLARS ($10.00) in hand paid by, the CITY OF PUEBLO, a Colorado municipal corporation, Grantee, hereby sells and conveys to, Grantee, whose address is 1 City Hall Place, Pueblo, CO 81003, the following real property situate in the County of Pueblo, State of Colorado, to-wit:

Lot 33, Pueblo Memorial Airport Industrial Park
Subdivision, County of Pueblo, State of Colorado

more commonly known by street and number as: 350 Keeler Pkwy., Pueblo, CO 81001.

TOGETHER with all and singular the hereditaments and appurtenances thereto, belonging, or in any otherwise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, and all of the estate, right, title, interest, claim, and demand whatsoever of the Grantor, either in law or in equity, of, in, and to the above bargained premises with the hereditaments and appurtenances.

TO HAVE AND TO HOLD the said premises above bargained and described with the appurtenances, unto the Grantee, its successors and assigns forever. Grantor for itself and its successors and/or assigns do covenant and agree that it shall and will warrant and forever defend the above bargained premises in the quiet and peaceful possession of the Grantee, its successors and assigns, against all and every person or persons claiming the whole or any part thereof, by, through or under the Grantor. The singular number shall include the plural and the plural the singular and the use of any gender shall be applicable to all genders. Said warranty is subject to rights-of-way, easements, covenants, plats, agreements and other restrictions of record as of the date of this Deed and any other exceptions or exclusions or rights of third parties not shown by the public records of which Grantee has actual knowledge, and subject to general property taxes for the entire year of 2026 and thereafter, and to the inclusions of the property within any special taxing district.

IN WITNESS WHEREOF, the Grantor has executed this Deed on the date set forth above.

PUEBLO DEVELOPMENT FOUNDATION, a Colorado nonprofit corporation

_____
Robert L. Root
Board President

STATE OF COLORADO)
) ss
COUNTY OF PUEBLO)

Subscribed and sworn to before me this _____ day of June, 2026 by Robert L. Root, Board President and authorized representative of the Pueblo Development Foundation, a Colorado nonprofit corporation.

Witness my hand and official seal.
My commission expires: _____

_____
Notary Public

SPECIAL WARRANTY DEED
(442 KEELER PARKWAY, PUEBLO, CO 81001)

THIS DEED, made, effective for all purposes on the 30th day of June, 2026 by and between the PUEBLO DEVELOPMENT FOUNDATION, a Colorado nonprofit corporation, Grantor, for and in consideration of the sum of TEN DOLLARS ($10.00) in hand paid by the CITY OF PUEBLO, a Colorado municipal corporation, Grantee, hereby sells and conveys to, Grantee, whose address is 1 City Hall Place, Pueblo, CO 81003, the following real property situate in the County of Pueblo, State of Colorado, to-wit:

Lot 31, Pueblo Memorial Airport Industrial Park
Subdivision, County of Pueblo, State of Colorado

more commonly known by street and number as: 442 Keeler Pkwy., Pueblo, CO 81001.

TOGETHER with all and singular the hereditaments and appurtenances thereto, belonging, or in any otherwise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, and all of the estate, right, title, interest, claim, and demand whatsoever of the Grantor, either in law or in equity, of, in, and to the above bargained premises with the hereditaments and appurtenances.

TO HAVE AND TO HOLD the said premises above bargained and described with the appurtenances, unto the Grantee, its successors and assigns forever. Grantor for itself and its successors and/or assigns do covenant and agree that it shall and will warrant and forever defend the above bargained premises in the quiet and peaceful possession of the Grantee, its successors and assigns, against all and every person or persons claiming the whole or any part thereof, by, through or under the Grantor. The singular number shall include the plural and the plural the singular and the use of any gender shall be applicable to all genders. Said warranty is subject to rights-of-way, easements, covenants, plats, agreements and other restrictions of record as of the date of this Deed and any other exceptions or exclusions or rights of third parties not shown by the public records of which Grantee has actual knowledge, and subject to general property taxes for the entire year of 2026 and thereafter, and to the inclusions of the property within any special taxing district.

IN WITNESS WHEREOF, the Grantor has executed this Deed on the date set forth above.

PUEBLO DEVELOPMENT FOUNDATION, a Colorado nonprofit corporation

_____
Robert L. Root
Board President

STATE OF COLORADO)
) ss
COUNTY OF PUEBLO)

Subscribed and sworn to before me this _____ day of June, 2026 by Robert L. Root, Board President and authorized representative of the Pueblo Development Foundation, a Colorado nonprofit corporation.

Witness my hand and official seal.
My commission expires: _____

_____
Notary Public

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Andrew Hayes, Public Works Director
Carla Sikes, City Attorney

SUBJECT: AN ORDINANCE APPROVING A MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, AND A CORPORATION REFERRED TO AS PROJECT FALCON CONCERNING A POTENTIAL ECONOMIC DEVELOPMENT PROJECT

SUMMARY:

Attached is an Ordinance approving a Memorandum of Understanding between the City of Pueblo and a corporation referred to as Project Falcon concerning a potential economic development project.

PREVIOUS COUNCIL ACTION:

On October 27, 2025, City Council approved Ordinance No. 11066 establishing Project Account ED2503 - St Charles Ind Pk Infrastructure and appropriated $8 million from the unappropriated fund balance of the half-cent sales tax fund for economic development for the purpose of funding planning, design, and construction of public improvements necessary to facilitate Project Falcon. This appropriation met the criteria for a use authorized under Sec. 14-4-85.5 (3) of Pueblo Municipal Code.

BACKGROUND:

The City collects a one-half-percent sales and use tax dedicated to primary-job-creating capital improvement projects within the City and the Pueblo Memorial Airport boundaries, with revenues deposited into the 1992-2031 Sales and Use Tax Capital Improvement Projects Fund (the “Fund”), most recently extended by voter-approved Ordinance No. 11001, effective November 5, 2025. The criteria, standards, and procedures for appropriation and expenditure of Fund revenues are codified in Chapter 4 of Title XIV of the Pueblo Municipal Code (“PMC”), as amended, including most recently by Ordinance No. 11125, effective February 24, 2026.

Project Falcon is a well-established international Consumer Packaged Goods manufacturing facility with multiple state-of-the-art production facilities that is considering locating a manufacturing operation and a renewable energy installation in the City of Pueblo. The City of Pueblo desires to assist Project Falcon with the location of its manufacturing operation and renewable energy installation in the City of Pueblo by offering Project Falcon a total incentive package valued at $68 million.

FINANCIAL IMPLICATIONS:

The Fund currently has an unencumbered balance of $65,016,098. The City, by Ordinance 11066, has already encumbered $8,000,000 toward infrastructure to serve Project Falcon within the St. Charles Industrial Park. Approval of this Ordinance would encumber an additional $57,000,000 in the Fund. Once encumbered, the funds will not be available for any other economic development projects.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If this Ordinance is not approved, the MOU will not be approved.

RECOMMENDATION:

None.

ATTACHMENTS:

None

ORDINANCE NO.

AN ORDINANCE APPROVING A MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION, AND A CORPORATION REFERRED TO AS PROJECT FALCON CONCERNING A POTENTIAL ECONOMIC DEVELOPMENT PROJECT

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The Memorandum of Understanding ("MOU"), between the City of Pueblo, a Colorado municipal corporation and a corporation referred to as Project Falcon concerning a potential economic development project, having been approved as to form by the City Attorney is hereby approved. The Mayor is authorized to execute and deliver the MOU in the name of the City and the City Clerk is directed to affix the seal of the City thereto and attest same.

SECTION 2.

The officers and staff of the City are authorized and directed to perform any and all acts consistent with this Ordinance and the attached MOU which are necessary or desirable to effectuate the transactions described therein.

SECTION 3.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Carla Sikes, City Attorney

SUBJECT: AN ORDINANCE APPROVING A SHORT-TERM LOAN AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION AND DESIGN FOR RECYCLE, LLC, A COLORADO LIMITED LIABILITY COMPANY FOR A SHORT-TERM LOAN TO SUPPORT REGIONAL RECYCLING CAPACITY AND LANDFILL DIVERSION, AND AUTHORIZING THE MAYOR TO EXECUTE SAME; ESTABLISHING PROJECT NO. PB2601 – DESIGN FOR RECYCLE; AND BUDGETING AND APPROPRIATING FUNDS FROM THE PLASTIC POLLUTION REDUCTION FUND TO PROJECT NO PB2601 – DESIGN FOR RECYCLE

SUMMARY:

Attached is an Ordinance approving a Short-Term Loan Agreement between the City of Pueblo and Design for Recycle, LLC, a Colorado limited liability company that operates a recycling processing business in Pueblo. The City would lend Design for Recycle Five Hundred Sixty-Eight Thousand Five Hundred Sixty-Four Dollars and Eight Cents ($568,564.08) from the Plastic Pollution Reduction Fund, solely to purchase and take delivery of a new baling machine. The loan bridges a timing gap created by a State reimbursement grant that pays Design for Recycle back only after it purchases the equipment.

The loan is repayable in full. Repayment is due the earlier of forty-five (45) days after Design for Recycle receives reimbursement under its State grant or twelve (12) months after disbursement. The Ordinance directs all repaid principal, interest, and other amounts to be returned to the Plastic Pollution Reduction Fund.

PREVIOUS COUNCIL ACTION:

None.

BACKGROUND:

Design for Recycle, LLC operates a recycling processing business at 20 Environmental Place in Pueblo that consolidates, processes, packs, and diverts recyclable plastics and other recyclable materials from local landfills. The State of Colorado, acting through the Department of Public Health and Environment and its C3 Grants and Enterprise program, awarded Design for Recycle a grant of $1,529,486 (Grant Agreement No. CT2026*2471), in part for the purchase of a new baling machine and related acquisition and delivery costs. The State of Colorado grant is a reimbursement grant. Design for Recycle must purchase the equipment with its own funds before the State will reimburse it.

The baling machine costs $568,564.08. To allow Design for Recycle to acquire the equipment before reimbursement, the City would make a short-term loan in that amount from the Plastic Pollution Reduction Fund. The City would issue a two-party check made payable jointly to Design for Recycle and the equipment vendor, so the loan proceeds can be used only to buy the baling machine. The Agreement restricts use of the proceeds to the acquisition and delivery of the machine and prohibits use for working capital, payroll, or any unrelated purpose.

The loan bears interest at six percent (6%) per annum, but interest is waived if Design for Recycle repays the loan in full by the end of the repayment period. If the loan is not repaid on time, accrued interest is added to principal and the balance accrues default interest at twelve percent (12%) per annum. Design for Recycle's repayment obligation is absolute and is not excused by any reduction, delay, or denial of the State reimbursement. Disbursement is conditioned on Design for Recycle delivering documentation specified in the Agreement, including grant award documentation, the vendor invoice, a current IRS Form W-9, evidence of insurance, evidence of good standing with the Colorado Secretary of State, and evidence of authority to enter into the Agreement.

The Plastic Pollution Reduction Fund is the special fund established under Section 7-3-48(b) of the Pueblo Municipal Code, which holds the carryout bag fees remitted to the City under the Colorado Plastic Pollution Reduction Act, C.R.S. § 25-17-501 *et seq.* Under Section 7-3-48(b)(2), the Fund may be used to pay for recycling, composting, or other waste diversion programs and related outreach and education activities. The loan supports regional recycling capacity and the diversion of recyclable materials from local landfills, and the loan proceeds return to the Fund upon repayment.

FINANCIAL IMPLICATIONS:

The Ordinance appropriates $568,564.08 from the Plastic Pollution Reduction Fund for the loan. The loan is repayable in full, and the City expects to recover the full principal because the State grant reimburses the full amount of the loan. All repaid amounts, including any interest and other amounts due, return to the Plastic Pollution Reduction Fund. If Design for Recycle repays on time, no interest is due and the net cost to the City is the temporary use of the appropriated funds during the repayment period. If Design for Recycle defaults, the unpaid balance accrues default interest at twelve percent (12%) per annum, and the City may pursue collection and recover its enforcement costs. The loan is unsecured.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If the Ordinance is not approved, the City will not make the loan, and Design for Recycle may be unable to purchase the baling machine in advance of State reimbursement. The regional recycling and landfill diversion capacity the equipment would provide would be delayed or lost.

RECOMMENDATION:

Approve the Ordinance.

ATTACHMENTS:

1. Design for Recycle Loan Agreement with Exhibits

ORDINANCE NO.

AN ORDINANCE APPROVING A SHORT-TERM LOAN AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION AND DESIGN FOR RECYCLE, LLC, A COLORADO LIMITED LIABILITY COMPANY FOR A SHORT-TERM LOAN TO SUPPORT REGIONAL RECYCLING CAPACITY AND LANDFILL DIVERSION, AND AUTHORIZING THE MAYOR TO EXECUTE SAME; ESTABLISHING PROJECT NO. PB2601 – DESIGN FOR RECYCLE; AND BUDGETING AND APPROPRIATING FUNDS FROM THE PLASTIC POLLUTION REDUCTION FUND TO PROJECT NO PB2601 – DESIGN FOR RECYCLE

WHEREAS, the City of Pueblo, a Colorado home rule municipal corporation, may enter into contracts on behalf of the Municipal Government by ordinance only under Section 3-9 of the City Charter, and may make appropriations and authorize the lawful expenditure of City funds by ordinance under Section 3-17 of the City Charter; and

WHEREAS, the State of Colorado enacted the Plastic Pollution Reduction Act, C.R.S. § 25-17-501 *et seq.*, and the City established the Plastic Pollution Reduction Fund under Section 7-3-48(b) of the Pueblo Municipal Code as a special fund, segregated from all other City funds, holding the carryout bag fees remitted to the City under the Act; and

WHEREAS, under Section 7-3-48(b)(2) of the Pueblo Municipal Code, the Plastic Pollution Reduction Fund may be used to pay for recycling, composting, or other waste diversion programs and related outreach and education activities; and

WHEREAS, Design for Recycle, LLC, a Colorado limited liability company, operates a recycling processing business in Pueblo that consolidates, processes, packs, and diverts recyclable plastics and other recyclable materials from local landfills; and

WHEREAS, Design for Recycle has received a reimbursement grant from the State of Colorado, acting through the Department of Public Health and Environment, in part for the purchase of a new baling machine, and the grant reimburses Design for Recycle only after it purchases the equipment with its own funds; and

WHEREAS, the City desires to make a short-term loan to Design for Recycle from the Plastic Pollution Reduction Fund, solely for the acquisition and delivery of the baling machine, in order to support regional recycling capacity and the diversion of recyclable materials from local landfills; and

WHEREAS, , the City Council finds that the loan supports recycling and waste diversion within the meaning of Section 7-3-48(b)(2) of the Pueblo Municipal Code and serves a public purpose, that the loan proceeds are restricted to the purchase and delivery of the baling machine, that the loan is an advance of the City's own appropriated funds that Design for Recycle must repay to the City in full with interest, and is not a loan or pledge of the City's credit or faith, does not make the City responsible for the debt or liability of Design for Recycle, and is not a donation or grant, and that all repaid amounts shall return to the Plastic Pollution Reduction Fund. NOW, THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The Short-Term Loan Agreement ("Agreement") between the City of Pueblo and Design for Recycle, LLC, a copy of which is attached hereto, having been approved as to form by the City Attorney, is hereby approved.

SECTION 2.

There is hereby appropriated from the Plastic Pollution Reduction Fund the sum of Five Hundred Sixty-Eight Thousand Five Hundred Sixty-Four Dollars and Eight Cents ($568,564.08) for the short-term loan to Design for Recycle, LLC authorized by the Agreement.

SECTION 3.

All amounts repaid to the City under the Agreement, including principal, interest, and any other amounts due, shall be deposited into and credited to the Plastic Pollution Reduction Fund.

SECTION 4.

The Mayor is authorized to execute the Agreement in the name of the City, and the City Clerk is directed to affix the seal of the City thereto and attest same.

SECTION 5.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance and the attached Agreement to effectuate the policies and procedures described therein.

SECTION 6.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

SHORT-TERM LOAN AGREEMENT

This Short-Term Loan Agreement ("Agreement") is entered into as of June 22, 2026 ("Effective Date"), by and between the City of Pueblo, Colorado, a Colorado municipal corporation ("City"), and Design for Recycle, LLC, a Colorado limited liability company ("Borrower"). The City and Borrower may be referred to individually as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, the State of Colorado enacted the Plastic Pollution Reduction Act, C.R.S. §§ 25-17-501 et seq. (the "Act"), restricting the use of single-use plastic carryout bags and imposing a fee for the continued use of such bags;

WHEREAS, pursuant Pueblo Muncipal Code ("PMC") § 7-3-48(b)(2), each store required to collect and remit carryout bag fees pursuant to the Act must pay a portion of those fees to the City, which collects those fees in a special fund designated as the "Plastic Pollution Reduction Fund" (hereinafter the "PPR Fund"); and

WHEREAS, pursuant to PMC § 7-3-48(b)(2) the PPR Fund can only be used for specific purposes including recycling, composting, or other waste diversion programs;

WHEREAS, Borrower operates a recycling processing business in Pueblo, Colorado and facilitates the consolidation, processing, packing, and diversion of recyclable plastics and other recyclable materials from local landfills; and

WHEREAS, Borrower has received a grant from the C3 Grants and Enterprise, Colorado Department of Public Health and Environment in the amount of $1,529,486, in part, for the purchase of a new baling machine and related acquisition and delivery costs (the "C3 Grant"); and

WHEREAS, Borrower has further represented to the City that the C3 Grant is structured as a reimbursement grant and that Borrower must first purchase the equipment out of pocket before receiving reimbursement from C3; and

WHEREAS, the City desires to provide a short-term loan to Borrower from the PPR Fund, solely for the acquisition and delivery of the baling machine described in this Agreement, in order to support regional recycling capacity, landfill diversion, and related public purposes.

NOW, THEREFORE, in consideration of the mutual covenants and promises contained in this Agreement, and other good and valuable consideration, the receipt and sufficiency of which are acknowledged, the Parties agree as follows:

ARTICLE 1 – DEFINITIONS

For purposes of this Agreement, the following terms have the meanings set forth below.

1.1 "Baling Machine" means the new baling equipment, together with ordinary and necessary related components, attachments, delivery, freight, and installation charges, if any, to be acquired by Borrower using the Loan Proceeds and more particularly described in Exhibit A.

1.2 "Business Day" means any day other than a Saturday, Sunday, or legal holiday observed by the City.

1.3 "C3 Grant" means the C3 Enterprise Grant administered by the Colorado Department of Public Health and Environment and State of Colorado as evidenced by Agreement No. CT2026*2471 attached hereto as Exhibit B.

1.4 "C3 Reimbursement" means any reimbursement, payment, disbursement, or other funds received by Borrower from the State of Colorado for, or in connection with the C3 Grant for or relating to the Baling Machine.

1.5 "Disbursement Date" means the date on which the City issues the two-party check described in Section 3.2.

1.6 "Loan" means the short-term loan from the City to Borrower in the original principal amount of Five Hundred Sixty-Eight Thousand Five Hundred Sixty-Four Dollars and Eight Cents ($568,564.08), subject to the terms of this Agreement.

1.7 "Loan Proceeds" means funds disbursed by the City to or for the benefit of Borrower under this Agreement.

1.8 "Principal" means the outstanding principal amount of the Loan, initially Five Hundred Sixty-Eight Thousand Five Hundred Sixty-Four Dollars and Eight Cents ($568,564.08), plus any interest, fees, costs, or other amounts added to principal under this Agreement.

1.9 "Repayment Period" means the period beginning on the Disbursement Date and ending on the earlier of: (a) forty-five (45) days after Borrower's receipt of any C3 Reimbursement; or (b) twelve months after the Disbursement Date.

ARTICLE 2 -- LOAN PURPOSE AND RESTRICTED USE OF FUNDS

2.1 Purpose

The Loan is made solely to assist Borrower with the acquisition and delivery of the Baling Machine to Borrower's principal place of business located at 20 Environmental Pl., Pueblo, Colorado 81004.

2.2 Restricted Use

Borrower shall use the Loan Proceeds only for the acquisition and delivery of the Baling Machine identified in Exhibit A. Borrower shall not use the Loan Proceeds for working capital, payroll, debt service, rent, utilities, distributions, dividends, management fees, owner compensation, unrelated equipment, taxes, penalties, fines, or any purpose unrelated to the acquisition and delivery of the Baling Machine.

2.3 No Change in Use Without City Approval
Borrower shall not materially change the equipment to be purchased, substitute another vendor, redirect the Loan Proceeds, or use the Loan Proceeds for any materially different cost or purpose without the City's prior written approval, which may be granted or withheld in the City's absolute and sole discretion. Purchasing any equipment other than that identified in Exhibit A, including other equipment listed in the C3 grant agreement, shall be considered a material change and a breach of this Agreement.

ARTICLE 3 -- LOAN AMOUNT AND DISBURSEMENT

3.1 Principal Amount
Subject to the terms and conditions of this Agreement, the City agrees to lend Borrower the principal amount of Five Hundred Sixty-Eight Thousand Five Hundred Sixty-Four Dollars and Eight Cents ($568,564.08).

3.2 Method and Timing of Disbursement
The City shall provide the Loan Proceeds by two-party check made payable jointly to Borrower and the Baling Machine vendor identified in Exhibit A. Subject to satisfaction of the conditions in Section 3.3 below, the City shall issue the two-party check within fourteen (14) days after the later of: (a) execution of this Agreement by Borrower; or (b) execution of this Agreement by the City.

3.3 Conditions Precedent to Disbursement
The City shall have no obligation to disburse the Loan Proceeds unless and until Borrower has delivered the following to the City, in form and substance reasonably acceptable to the City:

(a) a copy of the C3 Grant award notice, grant agreement (including all exhibits and attachments), award letter, or other documentation reasonably evidencing the C3 Grant and the reimbursement purpose;
(b) the vendor invoice, quote, purchase order, or equivalent documentation identifying the Baling Machine, vendor, price, payment instructions, and delivery location;
(c) Borrower's completed and current IRS Form W-9;
(d) evidence of insurance reasonably acceptable to the City, including commercial general liability insurance and any other insurance reasonably requested by the City for the ownership, transport, installation, or operation of the Baling Machine;
(e) evidence that Borrower is in good standing with the Colorado Secretary of State;
(f) evidence of Borrower's authority to enter into this Agreement, including any required member, manager, or company authorization;
(g) a fully completed disbursement checklist substantially in the form attached as Exhibit C; and
(h) any other documentation reasonably requested by the City to confirm that the Loan Proceeds will be used only for the purposes authorized by this Agreement.

3.4 No Security or Collateral
The Loan is unsecured. The City shall not require Borrower to grant a security interest in the Baling Machine or any other collateral as a condition of the Loan.

ARTICLE 4 – REPAYMENT

4.1 Repayment Obligation
Borrower shall repay the full outstanding Principal in one lump-sum payment on or before the last day of the Repayment Period. Borrower's repayment obligation is absolute and unconditional and is not limited to, conditioned on, or excused by the termination of the C3 grant agreement, or the amount, timing, denial, reduction, delay, cancellation, or nonreceipt of any C3 Reimbursement, except that receipt of C3 Reimbursement triggers the earlier repayment deadline described in Section 1.8.

4.2 Notice of C3 Reimbursement
Borrower shall provide written notice to the City within two (2) Business Days after Borrower receives any C3 Reimbursement. Borrower's notice shall identify the amount received, date received, payment source, and grant or reimbursement reference number, if available, and shall include reasonable supporting documentation.

4.3 Payment Amount and Payment Address
On or before the applicable due date, Borrower shall make a one-time payment in the amount of Five Hundred Sixty-Eight Thousand Five Hundred Sixty-Four Dollars and Eight Cents ($568,564.08), plus any interest, Default Interest, costs, fees, or other amounts due under this Agreement, to:

City of Pueblo Finance Department
101 W. Riverwalk
Pueblo, Colorado 81003

4.4 Prepayment
Borrower may prepay the Loan in whole or in part at any time without premium or penalty. Any partial prepayment shall be applied first to costs and fees due to the City, second to accrued Interest, if any, and third to outstanding Principal.

4.5 Interest
This Loan shall bear interest at the rate of six percent (6%) per annum from the date of disbursement until the end of the Repayment Period except that interest shall not be due so long as the Loan is repaid in full by the end of the Repayment Period. If the Loan is not repaid in full by the end of the Repayment Period, the full amount of the accrued Interest shall be added to the principal balance. Thereafter, beginning the day after the end of the Repayment Period, the full Principal balance of the Loan plus the accrued Interest shall accrue Default Interest pursuant to paragraph 8.3 of this Agreement.

ARTICLE 5 -- BORROWER REPRESENTATIONS AND WARRANTIES

Borrower represents and warrants to the City as follows:

5.1 Organization and Good Standing
Borrower is a Colorado limited liability company, duly organized, validly existing, and in good standing under the laws of the State of Colorado.

5.2 Authority
Borrower has full power and authority to execute, deliver, and perform this Agreement. The person signing this Agreement on behalf of Borrower has been duly authorized to do so.

5.3 No Conflict
Borrower's execution and performance of this Agreement will not violate Borrower's organizational documents, any agreement binding Borrower, any grant requirement known to Borrower, or any applicable law, order, rule, or regulation.

5.4 Grant Status
Borrower has received notice of the C3 Grant and has provided or will provide to the City true, correct, and complete copies of all material documents in Borrower's possession relating to the C3 Grant, the Baling Machine, and the reimbursement process.

5.5 Use of Funds
Borrower will use the Loan Proceeds solely for the purposes authorized by this Agreement.

5.6 No Misstatements
No representation, certification, document, or information provided by Borrower to the City in connection with this Agreement contains any material misstatement or omits any material fact necessary to make the information provided not misleading.

5.7 Compliance With Laws
Borrower shall comply with all applicable federal, state, and local laws, rules, regulations, ordinances, permits, licenses, and approvals relating to its business, the Baling Machine, the C3 Grant, and this Agreement.

SECTION 6 -- BORROWER COVENANTS

6.1 Acquisition and Delivery
Borrower shall promptly acquire and arrange delivery of the Baling Machine to 20 Environmental Pl., Pueblo, Colorado 81004. Borrower shall provide the City reasonable evidence of purchase, payment, delivery, and installation, as applicable.

6.2 Documentation
Borrower shall maintain complete and accurate books, records, invoices, receipts, grant correspondence, reimbursement requests, and payment records relating to the Loan, the Loan Proceeds, the C3 Grant, and the Baling Machine for not less than three (3) years after repayment in full of all amounts due under this Agreement.

6.3 Inspection and Records Review
Upon reasonable prior notice and during normal business hours, Borrower shall permit the City to inspect the Baling Machine and review records reasonably related to the Loan, Loan Proceeds, the C3 Grant, and compliance with this Agreement. The City shall conduct any inspection or review in a manner reasonably designed to avoid unnecessary disruption to Borrower's operations. Borrower shall provide to City copies of any and all documents requested by City.

6.4 C3 Communications and Reimbursement Requests
Borrower shall diligently pursue the C3 Reimbursement in accordance with applicable C3 Grant requirements. Borrower shall promptly provide the City with copies of material communications from C3 concerning approval, denial, reduction, delay, cancellation, disbursement, or reimbursement under the C3 Grant.

6.5 Notice of Material Events
Borrower shall notify the City in writing within five (5) Business Days after Borrower becomes aware of any event that could materially impair Borrower's ability to repay the Loan, obtain the C3 Reimbursement, acquire or retain the Baling Machine, or perform its obligations under this Agreement.

6.6 No Assignment
Borrower shall not assign, transfer, delegate, or encumber its rights or obligations under this Agreement without the City's prior written consent. Any attempted assignment without the City's prior written consent is void.

6.7 No Disposition of Baling Machine During Repayment Period
Until all amounts due under this Agreement have been paid in full, Borrower shall not sell, transfer, lease, encumber, lien, abandon, materially relocate outside the City of Pueblo, or otherwise dispose of the Baling Machine without the City's prior written consent, except in the ordinary course of maintenance, repair, replacement of parts, or warranty service.

SECTION 7 -- CITY COVENANTS AND LIMITATIONS

7.1 City Disbursement
Subject to Borrower's satisfaction of all conditions precedent and the other terms of this Agreement, the City shall disburse the Loan Proceeds as provided in Section 3.

7.2 Public Purpose and Fund Limitations
The Parties acknowledge that the Loan is intended to support recycling infrastructure, landfill diversion, and related public purposes. The City's obligations under this Agreement are limited by the lawful availability and permitted use of the PPR Fund and all applicable constitutional, statutory, charter, ordinance, budgetary, appropriation, and fiscal requirements.

7.3 No Waiver of Governmental Immunity
Nothing in this Agreement shall be construed as a waiver of the City's rights, defenses, limitations, or immunities under the Colorado Governmental Immunity Act, C.R.S. § 24-10-101 et seq., or any other applicable law.

7.4 No Multiple Fiscal Year Debt
To the extent applicable, nothing in this Agreement shall be construed to create a multiple fiscal year direct or indirect debt or financial obligation of the City within the meaning of Article X, Section 20 of the Colorado Constitution or any other constitutional, statutory, charter, or ordinance limitation. This Section shall not limit Borrower's obligation to repay the Loan.

SECTION 8 -- DEFAULT AND REMEDIES

8.1 Events of Default
Each of the following constitutes an "Event of Default" under this Agreement:

(a) Borrower fails to pay any amount due under this Agreement when due;

(b) Borrower uses any Loan Proceeds for a purpose not authorized by this Agreement;

(c) Borrower fails to acquire or arrange delivery of the Baling Machine as required by this Agreement, unless such failure is caused by vendor delay or other circumstances beyond Borrower's reasonable control and Borrower is diligently pursuing completion;

(d) Borrower fails to provide notice of C3 Reimbursement as required by Section 4.2;

(e) Borrower fails to provide records, grant documentation, inspection access, or other documentation required by this Agreement, and such failure continues for ten (10) days after written notice from the City;

(f) any representation, warranty, certification, or material information provided by Borrower to the City is false, misleading, or incomplete in any material respect when made;

(g) Borrower defaults under, materially breaches, or becomes ineligible for the C3 Grant due to Borrower's action or omission;

(h) Borrower becomes insolvent, makes an assignment for the benefit of creditors, admits in writing its inability to pay debts as they become due, commences or has commenced against it any bankruptcy, receivership, dissolution, or similar proceeding, or ceases ordinary business operations; or

(i) Borrower otherwise fails to perform any material obligation under this Agreement.

8.2 Acceleration
Upon the occurrence or continuation of an Event of Default, the City may declare all outstanding Principal, Interest, costs, fees, and other amounts due under this Agreement immediately due and payable without further notice, demand, presentment, protest, or other action, all of which Borrower waives to the fullest extent permitted by law.

8.3 Default Interest
Upon the occurrence and continuation of an Event of Default, interest shall accrue on the outstanding Principal amount at a rate of twelve percent (12%) per annum, compounded monthly on the first day of each month ("Default Interest"). Any Default Interest not paid when due shall be added to the Principal amount and shall thereafter bear interest at the same rate until paid in full. Default Interest shall accrue from the date of the Event of Default until all amounts due under this Agreement are paid in full.

8.4 Recovery of Costs
Borrower shall reimburse the City for all reasonable costs and expenses incurred by the City in enforcing this Agreement or collecting amounts due, including reasonable attorney fees, court costs, filing fees, collection costs, and costs of investigation, to the extent permitted by law.

8.5 Misuse of Funds
If Borrower uses any Loan Proceeds for a purpose not authorized by this Agreement, the City may require Borrower to immediately repay the misused amount, together with any other amounts due under this Agreement, and may pursue any other remedy available at law or in equity.

8.6 Equitable Relief
Borrower acknowledges that misuse of public funds, failure to maintain or provide required records, unauthorized disposition of the Baling Machine, or failure to comply with the restricted-use requirements of this Agreement may cause harm for which monetary damages may be inadequate. The City may seek specific performance, temporary restraining orders, preliminary injunctions, permanent injunctions, or other equitable relief without the necessity of posting bond, to the extent permitted by law.

8.7 Cumulative Remedies
The City's rights and remedies under this Agreement are cumulative and not exclusive. The City may exercise any right or remedy available under this Agreement, at law, or in equity, in any order and without waiving any other right or remedy.

8.8 No Waiver
No delay or failure by the City to exercise any right or remedy shall operate as a waiver of that right or remedy. No waiver shall be effective unless in writing and signed by the City. A waiver on one occasion shall not constitute a waiver on any other occasion.

9. Notices
All notices required or permitted under this Agreement shall be in writing and shall be delivered by personal delivery, nationally recognized overnight courier, certified U.S. mail return receipt requested, or email with confirmation of transmission, to the addresses below or to any other address designated by a Party by written notice.

If to City:
City of Pueblo
Attention: Mayor
1 City Hall Place
Pueblo, Colorado 81003
Email: mayor@pueblo.us

With copy to:
City Attorney's Office
City of Pueblo
101 W. Riverwalk Place, 4th Floor
Pueblo, Colorado 81003
Email: cityattorney@pueblo.us

If to Borrower:
Design for Recycle, LLC
20 Environmental Pl.
Pueblo, Colorado 81004

Attention: Justin Parker
Email: team@design4recycle.com

Notices are effective upon receipt, refusal of delivery, or confirmed email transmission if transmitted before 5:00 p.m. Mountain Time on a Business Day, or on the next Business Day if transmitted after that time or on a non-Business Day.

ARTICLE 10 -- GENERAL PROVISIONS

10.1 Governing Law, Venue and Waiver of Trial by Jury

This Agreement shall be governed by and construed in accordance with the laws of the State of Colorado, without regard to conflict-of-law principles. Exclusive venue for any action arising out of or relating to this Agreement shall be in the state courts located in Pueblo County, Colorado, unless exclusive jurisdiction lies in federal court, in which case venue shall be in the United States District Court for the District of Colorado. TO THE FULL EXTENT PERMITTED BY LAW, PARTIES WAIVE THEIR RIGHTS TO A TRIAL BY JURY FOR ALL CLAIMS ARISING UNDER THIS AGREEMENT.

10.2 Relationship of the Parties

The Parties are independent contracting parties. Nothing in this Agreement creates a partnership, joint venture, agency, employment, fiduciary, or other special relationship between the City and Borrower.

10.3 No Third-Party Beneficiaries

This Agreement is for the sole benefit of the Parties and their permitted successors and assigns. Nothing in this Agreement creates any right, claim, or remedy in favor of any third party, including the State of Colorado, the Baling Machine vendor, Borrower's customers, or any member of the public.

10.4 Entire Agreement

This Agreement, including all exhibits, constitutes the entire agreement between the Parties concerning the Loan and supersedes all prior or contemporaneous discussions, negotiations, proposals, term sheets, understandings, and agreements, whether written or oral, concerning the subject matter of this Agreement.

10.5 Amendment

This Agreement may be amended only by a written instrument signed by authorized representatives of both Parties and approved in accordance with any applicable City requirements.

10.6 Severability

If any provision of this Agreement is held invalid, illegal, or unenforceable, the remaining provisions shall remain in full force and effect to the maximum extent permitted by law.

10.7 Counterparts and Electronic Signatures

This Agreement may be executed in counterparts, each of which is deemed an original and all of which together constitute one instrument. Signatures delivered electronically or by portable document format are effective as original signatures to the fullest extent permitted by law.

10.8 Survival
Any provision that by its nature should survive expiration or termination of this Agreement shall survive, including repayment obligations, records obligations, audit and inspection rights, indemnity or reimbursement obligations, default remedies, governing law, venue, and no-waiver provisions.

10.9 Interpretation
The headings in this Agreement are for convenience only and do not affect interpretation. The word "including" means "including without limitation." The Parties acknowledge that each has had the opportunity to review this Agreement with legal counsel, and no rule of construction shall be applied against either Party as drafter.

10.10 Further Assurances
Borrower shall execute and deliver such additional documents and take such additional actions as the City may reasonably request to carry out the intent of this Agreement, verify use of Loan Proceeds, document the C3 Reimbursement, or evidence repayment.

11. SIGNATURES

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the Effective Date.

CITY:
CITY OF PUEBLO, COLORADO,
a Colorado home rule municipal corporation

_____
Heather Graham, Mayor
Date: _____

ATTEST:

_____
By: _____
Clyde Bishop, City Clerk

APPROVED AS TO FORM:

_____
Carla L. Sikes, City Attorney

BORROWER:
DESIGN FOR RECYCLE, LLC,
a Colorado limited liability company

By: _____

Name: _____
Its: _____
Date:_____

EXHIBIT A

Baling Machine and Vendor Information

1. Vendor name: **Altitude Recycling Equipment**
2. Vendor address: **4255 S. Buckley Rd., Ste. 503, Aurora, CO 80013**
3. Vendor contact name/email/phone: **720.427.3639; tyler@altituderecycling.com**
4. Equipment description/model number: **Excel Two Ram Baler 2R9D**
5. Serial number, if available: **assigned after down payment**
6. Purchase price: **$568,564.08 (funds allocated from City)**
7. Delivery address: **20 Environmental Pl., Pueblo, Colorado 81004**
8. Expected delivery date: **30 weeks after deposit ___**
9. Invoice, quote, or purchase order number: **$652,071.60 see quote**
   (30% deposit due with order, 60% due prior to shipping, 10% due at installation)

EXHIBIT B

State of Colorado Grant Agreement
Department of Public Health and Environment

With

Design for Recycle, LLC

Dated
October 31, 2025 – August 31, 2027

EXHIBIT C

Borrower must provide the following before City disbursement:

Item	Required	Received	Notes
Executed Agreement	Yes	____	____
C3 Grant award documentation	Yes	_Yes___	____Attached
Vendor invoice, quote, or purchase order	Yes	Yes_	Attached
Borrower W-9	Yes	____	____
Evidence of insurance	Yes	____	____
Colorado Secretary of State good-standing evidence	Yes	Yes	Attached
Borrower authorization to execute Agreement	Yes	____	____
Vendor information for two-party check	Yes	____	____
Delivery address confirmation	Yes	____	____
Any additional City-required documentation	If requested	____	____

STATE OF COLORADO GRANT AGREEMENT
DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Cover Page

State Agency:
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado 80246

Grantee:
Design for Recycle LLC

Agreement Maximum Amount:
Initial Term
10/31/2025-08/31/2027 $1,529,486.00
Extension Terms

Contract Maximum Amount:

Agreement Number:
CT 2026*2471

Agreement Performance Beginning Date:
October 31, 2025
Initial Agreement Expiration Date:
August 31, 2027
Fund Expenditure End Date:
August 31, 2027

Agreement Authority:
The C3 Enterprise is and operates as a government-owned business within CDPHE for the purpose of collecting the fee charged to waste producers and using the fee to provide grants, funding, and technical assistance and to pay for studies to promote a Circular Economy including waste diversion and aversion. The enterprise is overseen by the C3 Board of Directors. The department administers the grant program on behalf of the enterprise. See 25-16.5-109(3), C.R.S.

Agreement Purpose
This project serves to both protect public health and the environment in Colorado by increasing and improving waste diversion efforts in Pueblo County. Design for Recycle provides critical recycling solutions in Southeastern Colorado as the only processing facility in the area. Grant funding will support critical improvements and increase Design for Recycle's capacity to handle up to ten times the volume of materials currently processed.

The following Exhibits and Attachments are attached and incorporated into this Contract:

1. Exhibit A, Additional Provisions
2. Exhibit B, Statement of Work
3. Exhibit C, Budget
4. Exhibit D, Option Letter

Principal Representatives

For the State:
Megan Vinet, C3 Grants and Enterprise Unit Manager
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado 80246
megan.vinet@state.co.us

For Grantee:
Justin Parker
Design for Recycle LLC
20 Environmental Pl.
Pueblo, CO 81004
team@design4recycle.com

SIGNATURE PAGE

THE PARTIES HERETO HAVE EXECUTED THIS AGREEMENT

Each person signing this Agreement represents and warrants that the signer is duly authorized to execute this Agreement and to bind the Party authorizing such signature.

GRANTEE
Design for Recycle LLC

Signed by: Justin Parker
E7AE47C6B51A40A...
By: Signature

Justin Parker
Name of Person Signing for Grantee

Owner
Title of Person Signing for Grantee

Date: 2025-10-30

STATE OF COLORADO
Jared S. Polis, Governor
Colorado Circular Communities
Tyler Bandemer, Chairperson, C3 Board of Directors

Signed by:
ED2DA94226074A7...
By: Signature

Tyler Bandemer
Tyler Bandemer

Chairperson, C3 Board of Directors
Chairperson, C3 Board of Directors

Date: 2025-11-03

In accordance with §24-30-202, C.R.S., this Agreement is not valid until signed and dated below by the State Controller or an authorized delegate.

STATE CONTROLLER
Robert Jaros, CPA, MBA, JD

DocuSigned by: Kurt Williams
73365F4A4A084BC...
By: Signature

Kurt Williams
Name of State Controller Delegate

Controller
Title of State Controller Delegate

Date Executed: 2025-11-03

1. PARTIES

This Agreement is entered into by and between Grantee named on the Cover Page for this Agreement (the "Grantee"), and the STATE OF COLORADO acting by and through the State agency named on the Cover Page for this Agreement (the "State"). Grantee and the State agree to the terms and conditions in this Agreement.

2. TERM AND EFFECTIVE DATE

A. Effective Date

This Agreement shall not be valid or enforceable until the Effective Date, and the Grant Funds shall be expended by the Fund Expenditure End Date shown on the Signature and Cover Page for this Agreement. The State shall not be bound by any provision of this Agreement before the Effective Date, and shall have no obligation to pay Grantee for any Work performed or expense incurred before the Effective Date, except as described in §5.D, or after the Fund Expenditure End Date. If the Work will be performed in multiple phases, the period of performance start and end date of each phase is detailed under the Project Schedule in the Statement of Work Exhibit.

B. Initial Term

The Parties' respective performances under this Agreement shall commence on the Agreement Performance Beginning Date shown on the Cover Page for this Agreement and shall terminate on the Initial Agreement Expiration Date shown on the Cover Page for this Agreement (the "Initial Term") unless sooner terminated or further extended in accordance with the terms of this Agreement.

C. Extension Terms - State's Option

The State, at its discretion, shall have the option to extend the performance under this Agreement beyond the Initial Term for a period, or for successive periods, of one year or less at the same rates and under the same terms specified in this Agreement (each such period an "Extension Term"). In order to exercise this option, the State shall provide written notice to Grantee in a form substantially equivalent to Sample Option Letter attached to this Agreement.

D. End of Term Extension

If this Agreement approaches the end of its Initial Term, or any Extension Term then in place, the State, at its discretion, upon written notice to Grantee as provided in §14, may unilaterally extend such Initial Term or Extension Term for a period not to exceed two months (an "End of Term Extension"), regardless of whether additional Extension Terms are available or not. The provisions of this Agreement in effect when such notice is given shall remain in effect during the End of Term Extension. The End of Term Extension shall automatically terminate upon execution of a replacement Agreement or modification extending the total term of this Agreement.

E. Early Termination in the Public Interest

The State is entering into this Agreement to serve the public interest of the State of Colorado as determined by its Governor, General Assembly, or Courts. If this Agreement ceases to further the public interest of the State, the State, in its discretion, may terminate this Agreement in whole or in part. A determination that this Agreement should be terminated in the public interest shall not be equivalent to a State right to terminate for

convenience. This subsection shall not apply to a termination of this Agreement by the State for breach by Grantee, which shall be governed by 12.A.i.

i. Method and Content

The State shall notify Grantee of such termination in accordance with §14. The notice shall specify the effective date of the termination and whether it affects all or a portion of this Agreement, and shall include, to the extent practicable, the public interest justification for the termination.

ii. Obligations and Rights

Upon receipt of a termination notice for termination in the public interest, Grantee shall be subject to the rights and obligations set forth in §12.A.i.a.

iii. Payments

If the State terminates this Agreement in the public interest, the State shall pay Grantee an amount equal to the percentage of the total reimbursement payable under this Agreement that corresponds to the percentage of Work satisfactorily completed and accepted, as determined by the State, less payments previously made. Additionally, if this Agreement is less than 60% completed, as determined by the State, the State may reimburse Grantee for a portion of actual out-of-pocket expenses, not otherwise reimbursed under this Agreement, incurred by Grantee which are directly attributable to the uncompleted portion of Grantee's obligations, provided that the sum of any and all reimbursement shall not exceed the maximum amount payable to Grantee hereunder.

F. Grantee's Termination Under Federal Requirements

Grantee may request termination of this Grant by sending notice to the State, or to the Federal Awarding Agency with a copy to the State, which includes the reasons for the termination and the effective date of the termination. If this Grant is terminated in this manner, then Grantee shall return any advanced payments made for work that will not be performed prior to the effective date of the termination.

3. DEFINITIONS

The following terms shall be construed and interpreted as follows:

A. "Agreement" means this agreement, including all attached Exhibits, all documents incorporated by reference, all referenced statutes, rules and cited authorities, and any future modifications thereto.

B. "Breach of Agreement" means the failure of a Party to perform any of its obligations in accordance with this Agreement, in whole or in part or in a timely or satisfactory manner. The institution of proceedings under any bankruptcy, insolvency, reorganization or similar law, by or against Grantee, or the appointment of a receiver or similar officer for Grantee or any of its property, which is not vacated or fully stayed within 30 days after the institution of such proceeding, shall also constitute a breach. If Grantee is debarred or suspended under §24-109-105, C.R.S. at any time during the term of this Agreement, then such debarment or suspension shall constitute a breach.

C. "Budget" means the budget for the Work, as described in Exhibit C.

D. "Business Day" means any day in which the State is open and conducting business, but shall not include Saturday, Sunday or any day on which the State observes one of the holidays listed in §24-11-101(1), C.R.S.

E. "CORA" means the Colorado Open Records Act, §§24-72-200.1, *et seq.*, C.R.S.

F. "Effective Date" means the date on which this Agreement is approved and signed by the Colorado State Controller or designee, as shown on the Signature for this Agreement.

G. "End of Term Extension" means the time period defined in §2.D.

H. "Exhibits" means the exhibits and attachments included with this Agreement as shown on the Cover Page for this Agreement.

I. "Extension Term" means the time period defined in §2.C.

J. "Goods" means any movable material acquired, produced, or delivered by Grantee as set forth in this Agreement and shall include any movable material acquired, produced, or delivered by Grantee in connection with the Services.

K. "Grant Funds" means the funds that have been appropriated, designated, encumbered, or otherwise made available for payment by the State under this Agreement.

L. "Incident" means any accidental or deliberate event that results in or constitutes an imminent threat of the unauthorized access, loss, disclosure, modification, disruption, or destruction of any communications or information resources of the State, which are included as part of the Work, as described in §§24-37.5-401, *et seq*. C.R.S. Incidents include, without limitation, (i) successful attempts to gain unauthorized access to a State system or State Records regardless of where such information is located; (ii) unwanted disruption or denial of service; (iii) the unauthorized use of a State system for the processing or storage of data; or (iv) changes to State system hardware, firmware, or software characteristics without the State's knowledge, instruction, or consent.

M. "Initial Term" means the time period defined in §2.B.

N. "Matching Funds" means the funds provided Grantee as a match required to receive the Grant Funds.

O. "Party" means the State or Grantee, and "Parties" means both the State and Grantee.

P. "Services" means the services to be performed by Grantee as set forth in this Agreement, and shall include any services to be rendered by Grantee in connection with the Goods.

Q. "State Confidential Information" means any and all State Records not subject to disclosure under CORA. State Confidential Information shall include, but is not limited to, State personnel records not subject to disclosure under CORA. State Confidential Information shall not include information or data concerning individuals that is not deemed confidential but nevertheless belongs to the State, which has been communicated, furnished, or disclosed by the State to Grantee which (i) is subject to disclosure pursuant to CORA; (ii) is already known to Grantee without restrictions at the time of its disclosure to Grantee; (iii) is or subsequently becomes publicly available without breach of any obligation owed by Grantee to the State; (iv) is disclosed to Grantee, without confidentiality obligations, by a third party who has the right to disclose such information; or (v) was independently developed without reliance on any State Confidential Information.

R. "State Fiscal Rules" means the fiscal rules promulgated by the Colorado State Controller pursuant to §24-30-202(13)(a), C.R.S.

S. "State Fiscal Year" means a 12-month period beginning on July 1 of each calendar year and ending on June 30 of the following calendar year. If a single calendar year follows the term, then it means the State Fiscal Year ending in that calendar year.

T. "State Records" means any and all State data, information, and records, regardless of physical form, including, but not limited to, information subject to disclosure under CORA.

U. "Subcontractor" means third-parties, if any, engaged by Grantee to aid in performance of the Work. "Subcontractor" also includes sub-grantees of grant funds.

V. "Uniform Guidance" means the Office of Management and Budget Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.

W. "Work" means the Goods delivered and Services performed pursuant to this Agreement.

X. "Work Product" means the tangible and intangible results of the Work, whether finished or unfinished, including drafts. Work Product includes, but is not limited to, documents, text, software (including source code), research, reports, proposals, specifications, plans, notes, studies, data, images, photographs, negatives, pictures, drawings, designs, models, surveys, maps, materials, ideas, concepts, know-how, information, and any other results of the Work. "Work Product" does not include any material that was developed prior to the Effective Date that is used, without modification, in the performance of the Work.

Any other term used in this Agreement that is defined in an Exhibit shall be construed and interpreted as defined in that Exhibit.

4. STATEMENT OF WORK

Grantee shall complete the Work as described in this Agreement and in accordance with the provisions of Exhibit B. The State shall have no liability to compensate Grantee for the delivery of any goods or the performance of any services that are not specifically set forth in this Agreement.

5. PAYMENTS TO GRANTEE

A. Maximum Amount

Payments to Grantee are limited to the unpaid, obligated balance of the Grant Funds. The State shall not pay Grantee any amount under this Agreement that exceeds the Agreement Maximum for each State Fiscal Year shown on the Cover Page of this Agreement.

B. Payment Procedures

i. Invoices and Payment

a. The State shall pay Grantee in the amounts and in accordance with the schedule and other conditions set forth in the Budget, Exhibit C.

b. Grantee shall initiate payment requests by invoice to the State, in a form and manner approved by the State.

c. The State shall pay each invoice within 45 days following the State's receipt of that invoice, so long as the amount invoiced correctly represents Work completed by Grantee and previously accepted by the State during the term that the invoice

covers. If the State determines that the amount of any invoice is not correct, then Grantee shall make all changes necessary to correct that invoice.

d. The acceptance of an invoice shall not constitute acceptance of any Work performed or deliverables provided under this Agreement.

ii. Interest

Amounts not paid by the State within 45 days of the State's acceptance of the invoice shall bear interest on the unpaid balance beginning on the 45th day at the rate of 1% per month, as required by §24-30-202(24)(a), C.R.S., until paid in full; provided, however, that interest shall not accrue on unpaid amounts that the State disputes in writing. Grantee shall invoice the State separately for accrued interest on delinquent amounts, and the invoice shall reference the delinquent payment, the number of day's interest to be paid and the interest rate.

iii. Payment Disputes

If Grantee disputes any calculation, determination or amount of any payment, Grantee shall notify the State in writing of its dispute within 30 days following the earlier to occur of Grantee's receipt of the payment or notification of the determination or calculation of the payment by the State. The State will review the information presented by Grantee and may make changes to its determination based on this review. The calculation, determination or payment amount that results from the State's review shall not be subject to additional dispute under this subsection. No payment subject to a dispute under this subsection shall be due until after the State has concluded its review, and the State shall not pay any interest on any amount during the period it is subject to dispute under this subsection.

iv. Available Funds-Contingency-Termination

The State is prohibited by law from making commitments beyond the term of the current State Fiscal Year. Payment to Grantee beyond the current State Fiscal Year is contingent on the appropriation and continuing availability of Grant Funds in any subsequent year (as provided in the Colorado Special Provisions). If federal funds or funds from any other non-State funds constitute all or some of the Grant Funds, the State's obligation to pay Grantee shall be contingent upon such non-State funding continuing to be made available for payment. Payments to be made pursuant to this Agreement shall be made only from Grant Funds, and the State's liability for such payments shall be limited to the amount remaining of such Grant Funds. If State, federal or other funds are not appropriated, or otherwise become unavailable to fund this Agreement, the State may, upon written notice, terminate this Agreement, in whole or in part, without incurring further liability. The State shall, however, remain obligated to pay for Services and Goods that are delivered and accepted prior to the effective date of notice of termination, and this termination shall otherwise be treated as if this Agreement were terminated in the public interest as described in §2.E.

vi. Option to Increase or Decrease Maximum Amount

The State has the Option to increase or decrease the statewide quantity of Goods and Services based upon the rates established in this Agreement and increase or decrease the maximum amount payable accordingly. In order to exercise this option, the State shall provide written notice to Grantee in a form substantially equivalent to Sample Option Letter attached to this Agreement. Delivery of Goods and performance of

Services shall continue at the same rates and terms as described in this Agreement. The State may include and incorporate a revised budget with the option letter, as long as the revised budget does not unilaterally change rates or terms specified in this Agreement.

C. Matching Funds

Grantee shall provide Matching Funds as provided in §5.A and Exhibit C. Grantee's obligation to pay all or any part of any matching funds, whether direct or contingent, only extend to funds duly and lawfully appropriated for the purposes of this Agreement by the authorized representatives of Grantee and paid into Grantee's treasury or bank account. Grantee represents to the State that the amount designated "Grantee's Matching Funds" in Exhibit C has been legally appropriated for the purposes of this Agreement by its authorized representatives and paid into its treasury or bank account. Grantee shall not pay or be liable for any claimed interest, late charges, fees, taxes or penalties of any nature, except as required by Grantee's laws or policies.

D. Reimbursement of Grantee Costs

Only with prior written approval, the State shall reimburse Grantee's allowable costs, not exceeding the maximum total amount described in Exhibit C and §5.A for all allowable costs described in this Grant and shown in the Budget, except that Grantee may adjust the amounts between each line item of the Budget without formal modification to this Agreement as long as the Grantee provides notice to the State of the change, the change does not modify the total maximum amount of this Agreement or the maximum amount for any state fiscal year, and the change does not modify any requirements of the Work. However, any costs incurred by Grantee prior to the Effective Date shall not be reimbursed. Grantee's costs for Work performed after the Fund Expenditure End Date shown on the Signature and Cover Page for this Agreement, or after any phase performance period end date for a respective phase of the Work, shall not be reimbursable. The State shall only reimburse allowable costs described in this Agreement and shown in the Budget if those costs are:

i. Reasonable and necessary to accomplish the Work and for the Goods and Services provided; and

ii. Equal to the actual net cost to Grantee (i.e. the price paid minus any items of value received by Grantee that reduce the cost actually incurred).

E. Close-Out

Grantee shall close out this Award within 45 days after the Fund Expenditure End Date shown on the Signature and Cover Page for this Agreement. To complete close-out, Grantee shall submit to the State all deliverables (including documentation) as defined in this Agreement and Grantee's final reimbursement request or invoice. The State will withhold 5% of allowable costs until all final documentation has been submitted and accepted by the State as substantially complete.

6. REPORTING - NOTIFICATION

A. Reports Upon Request of the State

In addition to any reports required pursuant to §16 or pursuant to any other Exhibit, for any Agreement having a term longer than three months, Grantee shall submit, upon request of the State, a written report specifying progress made for each specified performance measure and standard in this Agreement. Such progress report shall be in accordance with the

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procedures developed and prescribed by the State. Progress reports shall be submitted to the State not later than five Business Days following the end of each calendar quarter or at such time as otherwise specified by the State.

B. Litigation Reporting

If Grantee is served with a pleading or other document in connection with an action before a court or other administrative decision making body, and such pleading or document relates to this Agreement or may affect Grantee's ability to perform its obligations under this Agreement, Grantee shall, within ten days after being served, notify the State of such action and deliver copies of such pleading or document to the State's Principal Representative identified on the Cover Page for this Agreement.

C. Performance and Final Status

Grantee shall submit all financial, performance and other reports to the State no later than 45 calendar days after the end of the Initial Term if no Extension Terms are exercised, or the final Extension Term exercised by the State, containing an evaluation and review of Grantee's performance and the final status of Grantee's obligations hereunder.

7. GRANTEE RECORDS

A. Maintenance

Grantee shall make, keep, maintain, and allow inspection and monitoring by the State of a complete file of all records, documents, communications, notes and other written materials, electronic media files, and communications, pertaining in any manner to the Work or the delivery of Services (including, but not limited to the operation of programs) or Goods hereunder. Grantee shall maintain such records for a period (the "Record Retention Period") of three years following the date of submission to the State of the final expenditure report, or if this Award is renewed quarterly or annually, from the date of the submission of each quarterly or annual report, respectively. If any litigation, claim, or audit related to this Award starts before expiration of the Record Retention Period, the Record Retention Period shall extend until all litigation, claims, or audit findings have been resolved and final action taken by the State Awarding Agency.

B. Inspection

Grantee shall permit the State, the federal government, and any other duly authorized agent of a governmental agency to audit, inspect, examine, excerpt, copy and transcribe Grantee Records during the Record Retention Period. Grantee shall make Grantee Records available during normal business hours at Grantee's office or place of business, or at other mutually agreed upon times or locations, upon no fewer than two Business Days' notice from the State, unless the State determines that a shorter period of notice, or no notice, is necessary to protect the interests of the State.

C. Monitoring

The State will monitor Grantee's performance of its obligations under this Agreement using procedures as determined by the State. The federal government and any other duly authorized agent of a governmental agency, in its discretion, may monitor Grantee's performance of its obligations under this Agreement using procedures as determined by that governmental entity. The State shall have the right, in its sole discretion, to change its monitoring procedures and requirements at any time during the term of this Agreement.

The State shall monitor Grantee's performance in a manner that does not unduly interfere with Grantee's performance of the Work.

D. Final Audit Report

Grantee shall promptly submit to the State a copy of any final audit report of an audit performed on Grantee's records that relates to or affects.

8. CONFIDENTIAL INFORMATION-STATE RECORDS

A. Confidentiality

Grantee shall keep confidential, and cause all Subcontractors to keep confidential, all State Records, unless those State Records are publicly available. Grantee shall not, without prior written approval of the State, use, publish, copy, disclose to any third party, or permit the use by any third party of any State Records, except as otherwise stated in this Agreement, permitted by law or approved in writing by the State. Grantee shall provide for the security of all State Confidential Information in accordance with all policies promulgated by the Colorado Office of Information Security and all applicable laws, rules, policies, publications, and guidelines. Grantee shall immediately forward any request or demand for State Records to the State's Principal Representative.

B. Other Entity Access and Nondisclosure Agreements

Grantee may provide State Records to its agents, employees, assigns and Subcontractors as necessary to perform the Work, but shall restrict access to State Confidential Information to those agents, employees, assigns and Subcontractors who require access to perform their obligations under this Agreement. Grantee shall ensure all such agents, employees, assigns, and Subcontractors sign agreements containing nondisclosure provisions at least as protective as those in this Agreement, and that the nondisclosure provisions are in force at all times the agent, employee, assign or Subcontractor has access to any State Confidential Information. Grantee shall provide copies of those signed nondisclosure provisions to the State upon execution of the nondisclosure provisions.

C. Use, Security, and Retention

Grantee shall use, hold and maintain State Confidential Information in compliance with any and all applicable laws and regulations in facilities located within the United States, and shall maintain a secure environment that ensures confidentiality of all State Confidential Information wherever located. Grantee shall provide the State with access, subject to Grantee's reasonable security requirements, for purposes of inspecting and monitoring access and use of State Confidential Information and evaluating security control effectiveness. Upon the expiration or termination of this Agreement, Grantee shall return State Records provided to Grantee or destroy such State Records and certify to the State that it has done so, as directed by the State. If Grantee is prevented by law or regulation from returning or destroying State Confidential Information, Grantee warrants it will guarantee the confidentiality of, and cease to use, such State Confidential Information.

D. Incident Notice and Remediation

If Grantee becomes aware of any Incident, it shall notify the State immediately and cooperate with the State regarding recovery, remediation, and the necessity to involve law enforcement, as determined by the State. Unless Grantee can establish that none of Grantee or any of its agents, employees, assigns or Subcontractors are the cause or source of the Incident, Grantee shall be responsible for the cost of notifying each person who may have

been impacted by the Incident. After an Incident, Grantee shall take steps to reduce the risk of incurring a similar type of Incident in the future as directed by the State, which may include, but is not limited to, developing and implementing a remediation plan that is approved by the State at no additional cost to the State. The State may adjust or direct modifications to this plan, in its sole discretion and Grantee shall make all modifications as directed by the State. If Grantee cannot produce its analysis and plan within the allotted time, the State, in its sole discretion, may perform such analysis and produce a remediation plan, and Grantee shall reimburse the State for the reasonable costs thereof.

9. CONFLICTS OF INTEREST

A. Actual Conflicts of Interest

Grantee shall not engage in any business or activities, or maintain any relationships that conflict in any way with the full performance of the obligations of Grantee under this Agreement. Such a conflict of interest would arise when a Grantee or Subcontractor's employee, officer or agent were to offer or provide any tangible personal benefit to an employee of the State, or any member of his or her immediate family or his or her partner, related to the award of, entry into or management or oversight of this Agreement.

B. Apparent Conflicts of Interest

Grantee acknowledges that, with respect to this Agreement, even the appearance of a conflict of interest shall be harmful to the State's interests. Absent the State's prior written approval, Grantee shall refrain from any practices, activities or relationships that reasonably appear to be in conflict with the full performance of Grantee's obligations under this Agreement.

C. Disclosure to the State

If a conflict or the appearance of a conflict arises, or if Grantee is uncertain whether a conflict or the appearance of a conflict has arisen, Grantee shall submit to the State a disclosure statement setting forth the relevant details for the State's consideration. Failure to promptly submit a disclosure statement or to follow the State's direction in regard to the actual or apparent conflict constitutes a breach of this Agreement.

D. Contractor acknowledges that all State employees are subject to the ethical principles described in §24-18-105, C.R.S. Contractor further acknowledges that State employees may be subject to the requirements of §24-18-105, C.R.S. with regard to this Contract.

10. INSURANCE

Grantee shall obtain and maintain, and ensure that each Subcontractor shall obtain and maintain, insurance as specified in this section at all times during the term of this Agreement. All insurance policies required by this Agreement that are not provided through self-insurance shall be issued by insurance companies as approved by the State.

A. Workers' Compensation

Workers' compensation insurance as required by state statute, and employers' liability insurance covering all Grantee or Subcontractor employees acting within the course and scope of their employment.

B. General Liability

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Commercial general liability insurance covering premises operations, fire damage, independent contractors, products and completed operations, blanket contractual liability, personal injury, and advertising liability with minimum limits as follows:

i. $1,000,000 each occurrence;

ii. $1,000,000 general aggregate;

iii. $1,000,000 products and completed operations aggregate; and

iv. $50,000 any one fire.

C. Automobile Liability

Automobile liability insurance covering any auto (including owned, hired and non-owned autos) with a minimum limit of $1,000,000 each accident combined single limit.

D. Additional Insured

The State shall be named as additional insured on all commercial general liability policies (leases and construction contracts require additional insured coverage for completed operations) required of Grantee and Subcontractors.

E. Primacy of Coverage

Coverage required of Grantee and each Subcontractor shall be primary and noncontributory over any insurance or self-insurance program carried by Grantee or the State.

F. Cancellation

All commercial insurance policies shall include provisions preventing cancellation or non-renewal, except for cancellation based on non-payment of premiums, without at least 30 days prior notice to Grantee and Grantee shall forward such notice to the State in accordance with §14 within seven days of Grantee's receipt of such notice.

G. Subrogation Waiver

All commercial insurance policies secured or maintained by Grantee or its Subcontractors in relation to this Agreement shall include clauses stating that each carrier shall waive all rights of recovery under subrogation or otherwise against Grantee or the State, its agencies, institutions, organizations, officers, agents, employees, and volunteers.

H. Public Entities

If Grantee is a "public entity" within the meaning of the Colorado Governmental Immunity Act, §§24-10-101, *et seq.*, C.R.S. (the "GIA"), Grantee shall maintain, in lieu of the liability insurance requirements stated above, at all times during the term of this Agreement such liability insurance, by commercial policy or self-insurance, as is necessary to meet its liabilities under the GIA. If a Subcontractor is a public entity within the meaning of the GIA, Grantee shall ensure that the Subcontractor maintain at all times during the terms of this Grantee, in lieu of the liability insurance requirements stated above, such liability insurance, by commercial policy or self-insurance, as is necessary to meet the Subcontractor's obligations under the GIA.

I. Certificates

For each commercial insurance plan provided by Grantee under this Agreement, Grantee shall provide to the State certificates evidencing Grantee's insurance coverage required in this Agreement within seven Business Days following the Effective Date. Grantee shall

provide to the State certificates evidencing Subcontractor insurance coverage required under this Agreement within seven Business Days following the Effective Date, except that, if Grantee's subcontract is not in effect as of the Effective Date, Grantee shall provide to the State certificates showing Subcontractor insurance coverage required under this Agreement within seven Business Days following Grantee's execution of the subcontract. No later than 15 days before the expiration date of Grantee's or any Subcontractor's coverage, Grantee shall deliver to the State certificates of insurance evidencing renewals of coverage. At any other time during the term of this Agreement, upon request by the State, Grantee shall, within seven Business Days following the request by the State, supply to the State evidence satisfactory to the State of compliance with the provisions of this section.

11. BREACH OF AGREEMENT

In the event of a Breach of Agreement, the aggrieved Party shall give written notice of Breach of Agreement to the other Party. If the notified Party does not cure the breach, at its sole expense, within 30 days after the delivery of written notice, the Party may exercise any of the remedies as described in §12 for that Party. Notwithstanding any provision of this Agreement to the contrary, the State, in its discretion, need not provide notice or a cure period and may immediately terminate this Agreement in whole or in part or institute any other remedy in this Agreement in order to protect the public interest of the State; or if Grantee is debarred or suspended under §24-109-105, C.R.S., the State, in its discretion, need not provide notice or cure period and may terminate this Agreement in whole or in part or institute any other remedy in this Agreement as of the date that the debarment or suspension takes effect.

12. REMEDIES

A. State's Remedies

If Grantee is in breach under any provision of this Agreement and fails to cure such breach, the State, following the notice and cure period set forth in §11, shall have all of the remedies listed in this section in addition to all other remedies set forth in this Agreement or at law. The State may exercise any or all of the remedies available to it, in its discretion, concurrently or consecutively.

i. Termination for Breach

In the event of Grantee's uncured breach, the State may terminate this entire Agreement or any part of this Agreement. Grantee shall continue performance of this Agreement to the extent not terminated, if any.

a. Obligations and Rights

To the extent specified in any termination notice, Grantee shall not incur further obligations or render further performance past the effective date of such notice, and shall terminate outstanding orders and subcontracts with third parties. However, Grantee shall complete and deliver to the State all Work not cancelled by the termination notice, and may incur obligations as necessary to do so within this Agreement's terms. At the request of the State, Grantee shall assign to the State all of Grantee's rights, title, and interest in and to such terminated orders or subcontracts. Upon termination, Grantee shall take timely, reasonable and necessary action to protect and preserve property in the possession of Grantee but in which the State has an interest. At the State's request, Grantee shall return materials owned by the State in Grantee's possession at the time of any

termination. Grantee shall deliver all completed Work Product and all Work Product that was in the process of completion to the State at the State's request.

b. Payments

Notwithstanding anything to the contrary, the State shall only pay Grantee for accepted Work received as of the date of termination. If, after termination by the State, the State agrees that Grantee was not in breach or that Grantee's action or inaction was excusable, such termination shall be treated as a termination in the public interest, and the rights and obligations of the Parties shall be as if this Agreement had been terminated in the public interest under §2.E.

c. Damages and Withholding

Notwithstanding any other remedial action by the State, Grantee shall remain liable to the State for any damages sustained by the State in connection with any breach by Grantee, and the State may withhold payment to Grantee for the purpose of mitigating the State's damages until such time as the exact amount of damages due to the State from Grantee is determined. The State may withhold any amount that may be due Grantee as the State deems necessary to protect the State against loss including, without limitation, loss as a result of outstanding liens and excess costs incurred by the State in procuring from third parties replacement Work as cover.

ii. Remedies Not Involving Termination

The State, in its discretion, may exercise one or more of the following additional remedies:

a. Suspend Performance

Suspend Grantee's performance with respect to all or any portion of the Work pending corrective action as specified by the State without entitling Grantee to an adjustment in price or cost or an adjustment in the performance schedule. Grantee shall promptly cease performing Work and incurring costs in accordance with the State's directive, and the State shall not be liable for costs incurred by Grantee after the suspension of performance.

b. Withhold Payment

Withhold payment to Grantee until Grantee corrects its Work.

c. Deny Payment

Deny payment for Work not performed, or that due to Grantee's actions or inactions, cannot be performed or if they were performed are reasonably of no value to the state; provided, that any denial of payment shall be equal to the value of the obligations not performed.

d. Removal

Demand immediate removal of any of Grantee's employees, agents, or Subcontractors from the Work whom the State deems incompetent, careless, insubordinate, unsuitable, or otherwise unacceptable or whose continued relation to this Agreement is deemed by the State to be contrary to the public interest or the State's best interest.

e. Intellectual Property

If any Work infringes, or if the State in its sole discretion determines that any Work is likely to infringe, a patent, copyright, trademark, trade secret or other intellectual property right, Grantee shall, as approved by the State (i) secure that right to use such Work for the State and Grantee; (ii) replace the Work with non infringing Work or modify the Work so that it becomes noninfringing; or, (iii) remove any infringing Work and refund the amount paid for such Work to the State.

B. Grantee's Remedies

If the State is in breach of any provision of this Agreement and does not cure such breach, Grantee, following the notice and cure period in §11 and the dispute resolution process in §13 shall have all remedies available at law and equity.

13. DISPUTE RESOLUTION

A. Initial Resolution

Except as herein specifically provided otherwise, disputes concerning the performance of this Agreement which cannot be resolved by the designated Agreement representatives shall be referred in writing to a senior departmental management staff member designated by the State and a senior manager designated by Grantee for resolution.

B. Resolution of Controversies

If the initial resolution described in §13.A. fails to resolve the dispute within ten Business Days, Grantee shall submit any alleged breach of this Agreement by the State to the Procurement Official of the State Agency named on the Cover Page of this Agreement as described in §24-101-301(30), C.R.S. for resolution following the same resolution of controversies process as described in §§24-106-109, and 24-109-101.1 through 24-109-505, C.R.S. (the "Resolution Statutes"), except that if Grantee wishes to challenge any decision rendered by the Procurement Official, Grantee's challenge shall be an appeal to the executive director of the Department of Personnel and Administration, or their delegate, in the same manner as described in the Resolution Statutes before Grantee pursues any further action. Except as otherwise stated in this Section, all requirements of the Resolution Statutes shall apply including, without limitation, time limitations regardless of whether the Colorado Procurement Code applies to this Agreement.

14. NOTICES AND REPRESENTATIVES

Each individual identified as a Principal Representative on the Cover Page for this Agreement shall be the principal representative of the designating Party. All notices required or permitted to be given under this Agreement shall be in writing, and shall be delivered (A) by hand with receipt required, (B) by certified or registered mail to such Party's principal representative at the address set forth below or (C) as an email with read receipt requested to the principal representative at the email address, if any, set forth on the Cover Page for this Agreement. If a Party delivers a notice to another through email and the email is undeliverable, then, unless the Party has been provided with an alternate email contact, the Party delivering the notice shall deliver the notice by hand with receipt required or by certified or registered mail to such Party's principal representative at the address set forth on the Cover Page for this Agreement. Either Party may change its principal representative or principal representative contact information, or may designate specific other individuals to receive certain types of notices in addition to or in

lieu of a principal representative, by notice submitted in accordance with this section without a formal amendment to this Agreement. Unless otherwise provided in this Agreement, notices shall be effective upon delivery of the written notice.

15. RIGHTS IN WORK PRODUCT AND OTHER INFORMATION

A. Work Product

i. Copyrights

To the extent that the Work Product (or any portion of the Work Product) would not be considered works made for hire under applicable law, Grantee hereby assigns to the State, the entire right, title, and interest in and to copyrights in all Work Product and all works based upon, derived from, or incorporating the Work Product; all copyright applications, registrations, extensions, or renewals relating to all Work Product and all works based upon, derived from, or incorporating the Work Product; and all moral rights or similar rights with respect to the Work Product throughout the world. To the extent that Grantee cannot make any of the assignments required by this section, Grantee hereby grants to the State a perpetual, irrevocable, royalty-free license to use, modify, copy, publish, display, perform, transfer, distribute, sell, and create derivative works of the Work Product and all works based upon, derived from, or incorporating the Work Product by all means and methods and in any format now known or invented in the future. The State may assign and license its rights under this license.

ii. Patents

In addition, Grantee grants to the State (and to recipients of Work Product distributed by or on behalf of the State) a perpetual, worldwide, no-charge, royalty-free, irrevocable patent license to make, have made, use, distribute, sell, offer for sale, import, transfer, and otherwise utilize, operate, modify and propagate the contents of the Work Product. Such license applies only to those patent claims licensable by Grantee that are necessarily infringed by the Work Product alone, or by the combination of the Work Product with anything else used by the State.

iii. Assignments and Assistance

Whether or not Grantee is under contract with the State at the time, Grantee shall execute applications, assignments, and other documents, and shall render all other reasonable assistance requested by the State, to enable the State to secure patents, copyrights, licenses and other intellectual property rights related to the Work Product. The Parties intend the Work Product to be works made for hire. Grantee assigns to the State and its successors and assigns, the entire right, title, and interest in and to all causes of action, either in law or in equity, for past, present, or future infringement of intellectual property rights related to the Work Product and all works based on, derived from, or incorporating the Work Product.

B. Exclusive Property of the State

Except to the extent specifically provided elsewhere in this Agreement, any pre-existing State Records, State software, research, reports, studies, photographs, negatives or other documents, drawings, models, materials, data and information shall be the exclusive property of the State (collectively, "State Materials"). Grantee shall not use, willingly allow, cause or permit Work Product or State Materials to be used for any purpose other

than the performance of Grantee's obligations in this Agreement without the prior written consent of the State. Upon termination of this Agreement for any reason, Grantee shall provide all Work Product and State Materials to the State in a form and manner as directed by the State.

C. Exclusive Property of Grantee

Grantee retains the exclusive rights, title, and ownership to any and all pre-existing materials owned or licensed to Grantee including, but not limited to, all pre-existing software, licensed products, associated source code, machine code, text images, audio and/or video, and third-party materials, delivered by Grantee under this Agreement, whether incorporated in a Deliverable or necessary to use a Deliverable (collectively, "Grantee Property"). Grantee Property shall be licensed to the State as set forth in this Agreement or a State approved license agreement: (i) entered into as exhibits to this Agreement, (ii) obtained by the State from the applicable third-party vendor, or (iii) in the case of open source software, the license terms set forth in the applicable open source license agreement.

16. STATEWIDE CONTRACT MANAGEMENT SYSTEM

If the maximum amount payable to Grantee under this Agreement is $100,000 or greater, either on the Effective Date or at any time thereafter, this section shall apply. Grantee agrees to be governed by and comply with the provisions of §§24-106-103, 24-102-206, 24-106-106, and 24-106-107, C.R.S. regarding the monitoring of vendor performance and the reporting of Agreement performance information in the State's Agreement management system ("Contract Management System" or "CMS"). Grantee's performance shall be subject to evaluation and review in accordance with the terms and conditions of this Agreement, Colorado statutes governing CMS, and State Fiscal Rules and State Controller policies.

17. GENERAL PROVISIONS

A. Assignment

Grantee's rights and obligations under this Agreement are personal and may not be transferred or assigned without the prior, written consent of the State. Any attempt at assignment or transfer without such consent shall be void. Any assignment or transfer of Grantee's rights and obligations approved by the State shall be subject to the provisions of this Agreement.

B. Subcontracts

Grantee shall not enter into any subgrant or subcontract in connection with its obligations under this Agreement without the prior, written approval of the State. Grantee shall submit to the State a copy of each such subgrant or subcontract upon request by the State. All subgrants and subcontracts entered into by Grantee in connection with this Agreement shall comply with all applicable federal and state laws and regulations, shall provide that they are governed by the laws of the State of Colorado, and shall be subject to all provisions of this Agreement.

C. Binding Effect

Except as otherwise provided in §17.A., all provisions of this Agreement, including the benefits and burdens, shall extend to and be binding upon the Parties' respective successors and assigns.

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D. Authority

Each Party represents and warrants to the other that the execution and delivery of this Agreement and the performance of such Party's obligations have been duly authorized.

E. Captions and References

The captions and headings in this Agreement are for convenience of reference only, and shall not be used to interpret, define, or limit its provisions. All references in this Agreement to sections (whether spelled out or using the § symbol), subsections, exhibits or other attachments, are references to sections, subsections, exhibits or other attachments contained herein or incorporated as a part hereof, unless otherwise noted.

F. Counterparts

This Agreement may be executed in multiple, identical, original counterparts, each of which shall be deemed to be an original, but all of which, taken together, shall constitute one and the same agreement.

G. Entire Understanding

This Agreement represents the complete integration of all understandings between the Parties related to the Work, and all prior representations and understandings related to the Work, oral or written, are merged into this Agreement. Prior or contemporaneous additions, deletions, or other changes to this Agreement shall not have any force or effect whatsoever, unless embodied herein.

H. Digital Signatures

If any signatory signs this agreement using a digital signature in accordance with the Colorado State Controller Contract, Grant and Purchase Order Policies regarding the use of digital signatures issued under the State Fiscal Rules, then any agreement or consent to use digital signatures within the electronic system through which that signatory signed shall be incorporated into this Agreement by reference.

I. Modification

Except as otherwise provided in this Agreement, any modification to this Agreement shall only be effective if agreed to in a formal amendment to this Agreement, properly executed and approved in accordance with applicable Colorado State law and State Fiscal Rules. Modifications permitted under this Agreement, other than Agreement amendments, shall conform to the policies issued by the Colorado State Controller.

J. Statutes, Regulations, Fiscal Rules, and Other Authority

Any reference in this Agreement to a statute, regulation, State Fiscal Rule, fiscal policy or other authority shall be interpreted to refer to such authority then current, as may have been changed or amended since the Effective Date of this Agreement.

K. External Terms and Conditions

Notwithstanding anything to the contrary herein, the State shall not be subject to any provision included in any terms, conditions, or agreements appearing on Grantee's or a Subcontractor's website or any provision incorporated into any click-through or online agreements related to the Work unless that provision is specifically referenced in this Agreement.

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L. Severability

The invalidity or unenforceability of any provision of this Agreement shall not affect the validity or enforceability of any other provision of this Agreement, which shall remain in full force and effect, provided that the Parties can continue to perform their obligations under this Agreement in accordance with the intent of this Agreement.

M. Survival of Certain Agreement Terms

Any provision of this Agreement that imposes an obligation on a Party after termination or expiration of this Agreement shall survive the termination or expiration of this Agreement and shall be enforceable by the other Party.

N. Taxes

The State is exempt from federal excise taxes under I.R.C. Chapter 32 (26 U.S.C., Subtitle D, Ch. 32) (Federal Excise Tax Exemption Certificate of Registry No. 84-730123K) and from State and local government sales and use taxes under §§39-26-704(1), *et seq.*, C.R.S. (Colorado Sales Tax Exemption Identification Number 98-02565). The State shall not be liable for the payment of any excise, sales, or use taxes, regardless of whether any political subdivision of the state imposes such taxes on Grantee. Grantee shall be solely responsible for any exemptions from the collection of excise, sales or use taxes that Grantee may wish to have in place in connection with this Agreement.

O. Third Party Beneficiaries

Except for the Parties' respective successors and assigns described in §17.A., this Agreement does not and is not intended to confer any rights or remedies upon any person or entity other than the Parties. Enforcement of this Agreement and all rights and obligations hereunder are reserved solely to the Parties. Any services or benefits which third parties receive as a result of this Agreement are incidental to this Agreement, and do not create any rights for such third parties.

P. Waiver

A Party's failure or delay in exercising any right, power, or privilege under this Agreement, whether explicit or by lack of enforcement, shall not operate as a waiver, nor shall any single or partial exercise of any right, power, or privilege preclude any other or further exercise of such right, power, or privilege.

Q. CORA Disclosure

To the extent not prohibited by federal law, this Agreement and the performance measures and standards required under §24-106-107, C.R.S., if any, are subject to public release through the CORA.

R. Standard and Manner of Performance

Grantee shall perform its obligations under this Agreement in accordance with the highest standards of care, skill and diligence in Grantee's industry, trade, or profession.

S. Licenses, Permits, and Other Authorizations

Grantee shall secure, prior to the Effective Date, and maintain at all times during the term of this Agreement, at its sole expense, all licenses, certifications, permits, and other authorizations required to perform its obligations under this Agreement, and shall ensure that all employees, agents and Subcontractors secure and maintain at all times during the

term of their employment, agency or Subcontractor, all license, certifications, permits and other authorizations required to perform their obligations in relation to this Agreement.

T. Indemnification

i. General Indemnification

Grantee shall indemnify, save, and hold harmless the State, its employees, agents and assignees (the "Indemnified Parties"), against any and all costs, expenses, claims, damages, liabilities, court awards and other amounts (including attorneys' fees and related costs) incurred by any of the Indemnified Parties in relation to any act or omission by Grantee, or its employees, agents, Subcontractors, or assignees in connection with this Agreement.

ii. Confidential Information Indemnification

Disclosure or use of State Confidential Information by Grantee in violation of §8 may be cause for legal action by third parties against Grantee, the State, or their respective agents. Grantee shall indemnify, save, and hold harmless the Indemnified Parties, against any and all claims, damages, liabilities, losses, costs, expenses (including attorneys' fees and costs) incurred by the State in relation to any act or omission by Grantee, or its employees, agents, assigns, or Subcontractors in violation of §8.

iii. Intellectual Property Indemnification

Grantee shall indemnify, save, and hold harmless the Indemnified Parties, against any and all costs, expenses, claims, damages, liabilities, and other amounts (including attorneys' fees and costs) incurred by the Indemnified Parties in relation to any claim that any Work infringes a patent, copyright, trademark, trade secret, or any other intellectual property right.

iv. Accessibility Indemnification

Grantee shall indemnify, save, and hold harmless the Indemnified Parties against any and all costs, expenses, claims, damages, liabilities, court awards and other amounts (including attorneys' fees and related costs) incurred by any of the Indemnified Parties in relation to Grantee's failure to comply with §§24-85-101, et seq., C.R.S., or the Accessibility Standards for Individuals with a Disability as established by OIT pursuant to Section §24-85-103 (2.5), C.R.S.

U. Accessibility

i. Grantee shall comply with and the Work Product provided under this Agreement shall be in compliance with all applicable provisions of §§24-85-101, et seq., C.R.S., and the Accessibility Standards for Individuals with a Disability, as established by the Governor's Office of Information Technology (OIT), pursuant to Section §24-85-103 (2.5), C.R.S. Grantee shall also comply with all State of Colorado technology standards related to technology accessibility and with a Level AA of the most current version of the Web Content Accessibility Guidelines (WCAG), incorporated in the State of Colorado technology standards.

ii. The State may require Grantee's compliance to the State's Accessibility Standards to be determined by a third party selected by the State to attest to Grantee's Work Product and software is in compliance with §§24-85-101, et seq., C.R.S., and the

Accessibility Standards for Individuals with a Disability as established by OIT pursuant to Section §24-85-103 (2.5), C.R.S.

18. COLORADO SPECIAL PROVISIONS (COLORADO FISCAL RULE 3-3)

These Special Provisions apply to all agreements except where noted in italics.

A. STATUTORY APPROVAL. §24-30-202(1), C.R.S.

This Agreement shall not be valid until it has been approved by the Colorado State Controller or designee. If this Agreement is for a Major Information Technology Project, as defined in §24-37.5-102(2.6), C.R.S., then this Agreement shall not be valid until it has been approved by the State's Chief Information Officer or designee.

B. FUND AVAILABILITY. §24-30-202(5.5), C.R.S.

Financial obligations of the State payable after the current State Fiscal Year are contingent upon funds for that purpose being appropriated, budgeted, and otherwise made available.

C. GOVERNMENTAL IMMUNITY.

Liability for claims for injuries to persons or property arising from the negligence of the State, its departments, boards, commissions committees, bureaus, offices, employees and officials shall be controlled and limited by the provisions of the Colorado Governmental Immunity Act, §24-10-101, *et seq*., C.R.S.; the Federal Tort Claims Act, 28 U.S.C. Pt. VI, Ch. 171 and 28 U.S.C. 1346(b), and the State's risk management statutes, §§24-30-1501, *et seq*. C.R.S. No term or condition of this Agreement shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protections, or other provisions, contained in these statutes.

D. INDEPENDENT CONTRACTOR.

Grantee shall perform its duties hereunder as an independent contractor and not as an employee. Neither Grantee nor any agent or employee of Grantee shall be deemed to be an agent or employee of the State. Grantee shall not have authorization, express or implied, to bind the State to any agreement, liability or understanding, except as expressly set forth herein. Grantee and its employees and agents are not entitled to unemployment insurance or workers compensation benefits through the State and the State shall not pay for or otherwise provide such coverage for Grantee or any of its agents or employees. Grantee shall pay when due all applicable employment taxes and income taxes and local head taxes incurred pursuant to this Agreement. Grantee shall (i) provide and keep in force workers' compensation and unemployment compensation insurance in the amounts required by law, (ii) provide proof thereof when requested by the State, and (iii) be solely responsible for its acts and those of its employees and agents.

E. COMPLIANCE WITH LAW.

Grantee shall comply with all applicable federal and State laws, rules, and regulations in effect or hereafter established, including, without limitation, laws applicable to discrimination and unfair employment practices.

F. CHOICE OF LAW, JURISDICTION, AND VENUE.

Colorado law, and rules and regulations issued pursuant thereto, shall be applied in the interpretation, execution, and enforcement of this Agreement. Any provision included or incorporated herein by reference which conflicts with said laws, rules, and regulations shall

be null and void. All suits or actions related to this Agreement shall be filed and proceedings held in the State of Colorado and exclusive venue shall be in the City and County of Denver.

G. PROHIBITED TERMS.

Any term included in this Agreement that requires the State to indemnify or hold Grantee harmless; requires the State to agree to binding arbitration; limits Grantee's liability for damages resulting from death, bodily injury, or damage to tangible property; or that conflicts with this provision in any way shall be void ab initio. Nothing in this Agreement shall be construed as a waiver of any provision of §24-106-109, C.R.S.

H. SOFTWARE PIRACY PROHIBITION.

State or other public funds payable under this Agreement shall not be used for the acquisition, operation, or maintenance of computer software in violation of federal copyright laws or applicable licensing restrictions. Grantee hereby certifies and warrants that, during the term of this Agreement and any extensions, Grantee has and shall maintain in place appropriate systems and controls to prevent such improper use of public funds. If the State determines that Grantee is in violation of this provision, the State may exercise any remedy available at law or in equity or under this Agreement, including, without limitation, immediate termination of this Agreement and any remedy consistent with federal copyright laws or applicable licensing restrictions.

I. EMPLOYEE FINANCIAL INTEREST/CONFLICT OF INTEREST. §§24-18-201 and 24-50-507, C.R.S.

The signatories aver that to their knowledge, no employee of the State has any personal or beneficial interest whatsoever in the service or property described in this Agreement. Grantee has no interest and shall not acquire any interest, direct or indirect, that would conflict in any manner or degree with the performance of Grantee's services and Grantee shall not employ any person having such known interests.

J. VENDOR OFFSET AND ERRONEOUS PAYMENTS. §§24-30-202(1) and 24-30-202.4, C.R.S.

Subject to §24-30-202.4(3.5), C.R.S., the State Controller may withhold payment under the State's vendor offset intercept system for debts owed to State agencies for: (i) unpaid child support debts or child support arrearages; (ii) unpaid balances of tax, accrued interest, or other charges specified in §§39-21-101, *et seq.*, C.R.S.; (iii) unpaid loans due to the Student Loan Division of the Department of Higher Education; (iv) amounts required to be paid to the Unemployment Compensation Fund; and (v) other unpaid debts owing to the State as a result of final agency determination or judicial action. The State may also recover, at the State's discretion, payments made to Grantee in error for any reason, including, but not limited to, overpayments or improper payments, and unexpended or excess funds received by Grantee by deduction from subsequent payments under this Agreement, deduction from any payment due under any other contracts, grants or agreements between the State and Grantee, or by any other appropriate method for collecting debts owed to the State.

EXCEL 2R9D TWO RAM BALER AND STEEL BELT CONVEYOR

Customer: Design for Recycle
20 Environmental Pl
Pueblo CO 81004

Date: May 20, 2026

EQUIPMENT	**PRICE**
Excel 2R9D Two Ram Baler	$ 387,500

- 50 HP/460 volt motor
- 9" bore x 106" stroke main cylinder
- 9" bore eject cylinder
- 3,000 PSI system pressure, automatic mode
- 162 PSI ram face pressure
- 40" wide x 65" long charge box opening
- 30" high x 45" wide x 60" long bale size
- Hardox 400 wear liners, replaceable, 3/8” thick on chamber floor and sidewalls
- 47,500 lbs. machine weight
- Hardened, serrated, rotatable cutting knives
- Bale release door
- Bale separation door
- Operator-free, PLC controls
- Air-to-oil heat exchanger
- Bale table
- Accent Automatic Wire Tier
- 17 second cycle time
- Standard load hopper
- Conveyor controls (up to 10 HP)

Oil Heater	$ 2,300
Conveyor Controls	Included
Upper Photo Eye	Included
Hydraulic Oil (320 Gallons)	To be Provided by Customer

Baler Subtotal: $ 389,800

Take your recycling to its highest point
Tyler Francis (720) 427 - 3639
Tyler@AltitudeRecycling.com

Altitude
RECYCLING EQUIPMENT

Fluent Conveyors HD Roller Chain Steel Belt Conveyor	$ 182,500

- 60” wide belt, 3” x 3/8” tall cleats on 72” centers
- 3” rollers on 6” pitch, ¼” thick steel pans
- 4” high precision die formed interlocking off set wings
- ¼” steel structural tubing frame
- 12” tail load depth, 36” incline load depth
- 8ft usable pit section
- 48” Pit Depth
- 6” x 6” rectangular tube adjustable leg supports
- Push button E-stops on each side
- Auto chain oilers
- 10 HP Motor

Upper Hopper Extension	Included
Pit Plates	Included
Estimated Freight to Pueblo CO (3 Trucks)	$ 15,000
Estimated Installation, Start-Up, and Training	$ 25,000
Estimated Crane Service to Unload Baler	$ 2,500
Estimated Lifting Equipment	$ 5,000
Stem of Baling Wire	$ 3,000
TOTAL:	**$ 622,800**
State Sales Tax:	Exempt
Estimated Local Sales Tax (4.7%):	$ 29,271.60
Total with Sales Tax:	$ 652,071.60

*Prices are good for 15 days

*Estimated lead-time: 35-40 weeks subject to prior sales

*Terms – 30% deposit due with order, 60% due prior to shipping, 10% due at installation

*Work is quoted to occur during normal business hours. After hours, nights, weekends and holiday work will incur additional overtime charges

*Freight is estimate only, actual cost will depend on rates at time of shipment

*Installation cost is subject to final site survey

*Permitting and engineering is not included

*Electrical work not included in installation, power to be provided by customer

THIS PROPOSAL IS SUBJECT TO A FINAL SITE SURVEY

Take your recycling to its highest point
Tyler Francis (720) 427 - 3639
Tyler@AltitudeRecycling.com

TREASURY/IRS AND OMB USE ONLY DRAFT

Form **W-9**
(Rev. January 2026)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give form to the requester. Do not send to the IRS.

Before you begin. For guidance related to the purpose of Form W-9, see *Purpose of Form*, on page 2.

See ***Specific Instructions*** on page 3.

1 Name of entity/individual. An entry is required. (For a sole proprietorship or disregarded entity, enter the owner's name on line 1, and enter the business/disregarded entity's name on line 2.)

Design for Recycle, LLC

2 Business name/disregarded entity name, if different from above.

3a Check the appropriate box for federal tax classification of the entity/individual whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor ☐ C corporation ☐ S corporation ☐ Partnership ☐ Trust/estate

☑ LLC. Enter the tax classification (C = C corporation, S = S corporation, P = Partnership) . . . . . **P**

Note: Check the "LLC" box above and, in the entry space, enter the appropriate code (C, S, or P) for the tax classification of the LLC, unless it is a disregarded entity. A disregarded entity should instead check the appropriate box for the tax classification of its owner.

☐ Other (see instructions)

3b If on line 3a you checked "Partnership" or "Trust/estate," or checked "LLC" and entered "P" as its tax classification, and you are providing this form to a partnership, trust, or estate in which you have an ownership interest, check this box if you have any foreign partners, owners, or beneficiaries. See instructions . . . . . ☐

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 4):

Exempt payee code (if any)

Exemption from Foreign Account Tax Compliance Act (FATCA) reporting code (if any)

(Applies to accounts maintained outside the United States.)

5 Address (number, street, and apt. or suite no.). See instructions.

20 Environmental Pl.

6 City, state, and ZIP code

Pueblo, CO 81004

Requester's name and address (optional)

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). Do not report the employer identification number (EIN) of a sole proprietorship or disregarded entity. For a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your EIN. If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. See also *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–		–				

or

Employer identification number

8	2	–	4	3	5	4	4	4	1

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct; and
5. ☐ I am exempt from information reporting as a U.S. digital asset broker within the meaning of Regulations section 1.6045-1(g)(4)(i)(A)(1) (other than a registered investment adviser). I claim exempt status under Regulations section 1.6045-1(c)(3)(i)(B)(12).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and, generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here **Signature of U.S. person** [signature] **Date** 2 / 26 / 26

Cat. No. 10231X

Form **W-9** (Rev. 1-2026) Created 8/27/25

DRAFT — DO NOT FILE

DRAFT — DO NOT FILE

OFFICE OF THE SECRETARY OF STATE
OF THE STATE OF COLORADO

CERTIFICATE OF FACT OF GOOD STANDING

I, Jena Griswold, as the Secretary of State of the State of Colorado, hereby certify that, according to the records of this office,

Design for Recycle LLC

is a

Limited Liability Company

formed or registered on 02/06/2018 under the law of Colorado, has complied with all applicable requirements of this office, and is in good standing with this office. This entity has been assigned entity identification number 20181112119 .

This certificate reflects facts established or disclosed by documents delivered to this office on paper through 01/14/2026 that have been posted, and by documents delivered to this office electronically through 01/15/2026 @ 13:58:57 .

I have affixed hereto the Great Seal of the State of Colorado and duly generated, executed, and issued this official certificate at Denver, Colorado on 01/15/2026 @ 13:58:57 in accordance with applicable law. This certificate is assigned Confirmation Number 18086055 .

Jena Griswold

Secretary of State of the State of Colorado

**********End of Certificate**********

Notice: A certificate issued electronically from the Colorado Secretary of State's website is fully and immediately valid and effective. However, as an option, the issuance and validity of a certificate obtained electronically may be established by visiting the Validate a Certificate page of the Secretary of State's website, https://www.coloradosos.gov/biz/CertificateSearchCriteria.do entering the certificate's confirmation number displayed on the certificate, and following the instructions displayed. Confirming the issuance of a certificate is merely optional and is not necessary to the valid and effective issuance of a certificate. For more information, visit our website, https://www.coloradosos.gov click "Businesses, trademarks, trade names" and select "Frequently Asked Questions."

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Carla Sikes, City Attorney

SUBJECT: AN ORDINANCE (1) APPROVING AND AUTHORIZING THE MAYOR TO EXECUTE AN EMPLOYMENT AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION AND TRANSPORTATION TECHNOLOGY CENTER, INC., A DELAWARE CORPORATION, RELATING TO A JOB CREATING CAPITAL IMPROVEMENT PROJECT AND (2) APPROVING AND AUTHORIZING THE MAYOR TO EXECUTE A CONTRACT TO BUY AND SELL REAL ESTATE BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION AND TRANSPORTATION TECHNOLOGY CENTER, INC., A DELAWARE CORPORATION, AND RELATED SPECIAL WARRANTY DEED RELATING TO A PARCEL OF IMPROVED LAND LOCATED IN THE PUEBLO MEMORIAL AIRPORT INDUSTRIAL PARK – 350 KEELER PARKWAY

SUMMARY:

Attached is an Ordinance approving and authorizing the Mayor to sign the following agreements:

- Employment Agreement between the City of Pueblo and Transportation Technology Center, Inc., a Delaware corporation (“TTCI”);
- A Contract to Buy and Sell Real Estate between the City of Pueblo and TTCI; and
- Special Warranty Deed for the transfer of real property commonly known as 350 Keeler Parkway, Pueblo, Colorado 81001.

PREVIOUS COUNCIL ACTION:

On or about May 17, 2021, by Ordinance No. 9926, City Council approved an Employment Agreement with TTCI.

BACKGROUND:

TTCI originated in 1971 as the High Speed Ground Test Center under the U.S. Department of Transportation. Currently, TTCI serves as a central hub for transportation research and development, training, and testing across the entire spectrum of the transportation industry. This encompasses government, education, and commercial entities.

On May 10, 2021, the City entered into an Employment Agreement with TTCI by which it agreed to employ 175 employees at an average annual salary of $73,333 plus benefits. TTCI leased two buildings at the Airport Industrial Park: 350 Keeler Parkway and 442 Keeler Parkway. The economic incentive provided by the City was rent abatement for the duration of the leases, which was five years. The leases expire on June 30, 2026. TTCI fulfilled all the requirements of the Employment Agreement.

In addition to fulfilling all the requirements of the Employment Agreement, TTCI invested approximately $7,000,000 of its own funds into improvements to the property at 350 Keeler Parkway (the “Property”). These improvements include but are not limited to the following:

- Painting completed and new flooring installed throughout the office area
- Installation of direct fiber internet to the building
- Repairs and enhancements to drainage and gutter system around the entire building
- Replacement of the full roof of the office portion of the building
- Repairs and partial replacement of the high-bay roof to address active leaks
- Replacement of two rooftop RTU’s serving the office area due to the others being at the end of their useful life
- Installation of two air handling units for the high-bay heating in the south high-bay
- Installation of new overhead crane in the east building addition
- Installation of new road base and rock added in the north laydown yard and east dock areas to improve drainage and accessibility
- Installation of new compressed-air system
- Installation of electrical infrastructure upgrades in high-bay

In 2020, the Property was valued at $5,500,000. As of today, with the benefit of these improvements, the Property is valued at $10,750,000.

TTCI currently employs two hundred (200) employees and hopes to add up to forty (40) new employees at an average annual salary for all employees, old and new, of $92,000 before benefits.

The Economic Development Agreement proposed by this Ordinance provides for the transfer of the property located at 350 Keeler Parkway in the Airport Industrial Park to TTCI. TTCI must retain at least 200 employees at the site at an average annual salary

of $92,000 before benefits for ten (10) years. The Employment Agreement is secured by a Deed of Trust on the Property.

Beyond its direct employment and capital investment, MxV Rail drives meaningful economic activity by attracting visitors from across the country and around the world to Pueblo. The Security and Emergency Response Training Center delivers training annually from February through November, serving approximately 2,000 first responders each year who travel to Pueblo and utilize local hotels, restaurants, transportation, and retail services during their stay. This program alone generates an estimated $2.4 million in annual economic activity. In addition, MxV Rail's Annual Research Review brings approximately 300 attendees to the community for multi-day engagements of three to five days, further increasing demand for local hospitality and service industries. Outside of these programs, MxV Rail regularly hosts domestic and international visitors who tour the facility and collaborate with its experts, further supporting local businesses and reinforcing Pueblo's position as a hub for rail innovation, workforce development, and industry investment.

The economic incentive contemplated by this Ordinance will retain no less than 200 primary jobs, encourage the creation of up to 40 new primary jobs and promote an economic catalyst project as defined by PMC § 14-4-85.1(3.1). The economic incentive is further supported by the fact that TTCI has already invested approximately $7,000,000 of capital improvements in the property. The Employment Agreement extends for ten (10) years, which is longer than the average employment agreement and will be secured by a Deed of Trust against the real property at 350 Keeler Parkway.

FINANCIAL IMPLICATIONS:

This Ordinance does not involve the transfer of funds but rather the transfer of real property valued at $10,750,000.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If this Ordinance is not approved, TTCI may explore re-locating its transportation technology complex to a new location outside of Pueblo County.

RECOMMENDATION:

The Pueblo Economic Development Corporation recommends approval of this Ordinance.

ATTACHMENTS:

1. Contract to Buy and Sell Real Estate (MxV Rail)
2. Exhibit 1 to Contract to Buy and Sell Real Estate Special Warranty Deed -- 350

Keeler Pkwy (City to MxV)

3. Exhibit 2 to Contract to Buy and Sell Real Estate -- MxV Rail Agreement
4. Exhibit 3 to Contract to Buy and Sell Real Estate -- Deed of Trust (MxV Rail)

ORDINANCE NO.

AN ORDINANCE (1) APPROVING AND AUTHORIZING THE MAYOR TO EXECUTE AN EMPLOYMENT AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION AND TRANSPORTATION TECHNOLOGY CENTER, INC., A DELAWARE CORPORATION, RELATING TO A JOB CREATING CAPITAL IMPROVEMENT PROJECT AND (2) APPROVING AND AUTHORIZING THE MAYOR TO EXECUTE A CONTRACT TO BUY AND SELL REAL ESTATE BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION AND TRANSPORTATION TECHNOLOGY CENTER, INC., A DELAWARE CORPORATION, AND RELATED SPECIAL WARRANTY DEED RELATING TO A PARCEL OF IMPROVED LAND LOCATED IN THE PUEBLO MEMORIAL AIRPORT INDUSTRIAL PARK – 350 KEELER PARKWAY

WHEREAS, the City collects a one-half-percent sales and use tax dedicated to primary-job-creating capital improvement projects within the City and the Pueblo Memorial Airport boundaries, with revenues deposited into the 1992-2031 Sales and Use Tax Capital Improvement Projects Fund (the "Fund"), most recently extended by voter-approved Ordinance No. 11001, effective November 5, 2025;

WHEREAS, the criteria, standards, and procedures for appropriation and expenditure of Fund revenues are codified in Chapter 4 of Title XIV of the Pueblo Municipal Code ("PMC"), as amended, including most recently by Ordinance No. 11125, effective February 24, 2026 (the "Criteria"); and

WHEREAS, Transportation Technology Center, Inc. ("TTCI") has submitted an application to the City for an economic development incentive in the form of a land acquisition; and

WHEREAS, City Council having reviewed TTCI's application finds under PMC § 14-4-85.3(b)(1) that the project described therein is not speculative and that TTCI has demonstrated its financial ability and experience necessary to complete and operate the project; and

WHEREAS, City Council finds that TTCI has a substantial impact on the economic well-being on the City, community and region by attracting visitors from across the country and around the world to Pueblo through its Security and Emergency Response Training Center which serves approximately 2,000 first responders each year who travel to Pueblo and utilize local hotels, restaurants, transportation, and retail services during their stay, and generates an estimated $2.4 million in annual economic activity to the region. And therefore, TTCI qualifies as an Economic Catalyst Project as defined in PMC 14-4-85.1(3.1); and

WHEREAS, City Council finds that TTCI provides primary jobs to the community as defined in PMC § 14-4-85.1(7) and retention of the existing two hundred (200) primary jobs at an average annual salary of $92,000 will substantially benefit the public; and

WHEREAS, City Council may pursuant to PMC § 14-4-85.5(1) authorize expenditure of monies in the Fund for the acquisition of land or existing buildings for the purpose of making such land or buildings available to applicants that meet the standards and criteria of PMC 14-4-85.1 *et seq.* NOW THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

City Council finds and determines TTCI has a substantial impact on the economic well-being on the City, community and region by attracting visitors from across the country and around the world to Pueblo through its Security and Emergency Response Training Center and generating an estimated $2.4 million in annual economic activity to the region. And therefore, TTCI qualifies as an Economic Catalyst Project as defined in PMC 14-4-85.1(3.1). City Council further finds and determines that TTCI provides primary jobs to the community as defined in PMC § 14-4-85.1(7) and retention of the existing two hundred (200) primary jobs at an average annual salary of $92,000 will substantially benefit the community. For all the reasons stated above and herein, City Council hereby authorizes, pursuant to PMC § 14-4-85.5(1), the transfer of the real property commonly known as 350 Keeler Parkway to TTCI and determines that it meets the standards and criteria of PMC 14-4-85.1 *et seq.*

SECTION 2.

The following agreements, all dated June 30, 2026, copies of which are attached hereto and incorporated herein by this reference, having been approved as to form by the City Attorney, are approved:

- Employment Agreement between the City of Pueblo and TTCI;
- Contract to Buy and Sell Real Estate
- Special Warrant Deed
- Deed of Trust

The Mayor is authorized to execute and deliver said agreements in the name of the City and the City Clerk is authorized to affix the seal of the City thereto and attest same. The Mayor is further authorized to execute and deliver the Special Warranty Deed and related documents at closing transferring 350 Keeler Parkway, Pueblo, Colorado to TTCI.

SECTION 3.

The officers and staff of the City are authorized to perform any and all acts consistent with this Ordinance and the attached agreements which are necessary or appropriate to implement the transactions described therein.

SECTION 4.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on _____.

Final adoption of Ordinance by City Council on _____.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

CONTRACT TO BUY AND SELL REAL ESTATE

THIS CONTRACT ("**Agreement**") is made the 30th day of June 2026, between the City of Pueblo, a Colorado municipal corporation (hereinafter called the "**Seller**"), and Transportation Technology Center, Inc., a Delaware corporation (hereinafter called the "**Purchaser**").

1. Property Defined. The Seller agrees to sell and convey to the Purchaser, and the Purchaser agrees to purchase from the Seller, all that certain plat, piece, and improved parcel of land having the following legal description:

LOT 33, PUEBLO MEMORIAL AIRPORT INDUSTRIAL PARK SUBDIVISION, COUNTY OF PUEBLO, STATE OF COLORADO

also known by street and number as 350 Keeler Parkway, Pueblo, CO 81001.

(the "**Property**"). The Property shall be conveyed by Special Warrant Deed ("**Deed**") a form of which, marked as **Exhibit 1**, is attached hereto and incorporated herein by reference. The Property shall be conveyed subject to and subordinate to all easements, reservations, restrictions, covenants, limitations, rights-of-way and conditions of record and zoning and subdivision regulations and resolutions of the City of Pueblo and the Permitted Exceptions (as hereinafter defined), which shall be listed as exceptions in **Exhibit A** to the Bargain and Sale Deed, subject to satisfaction of the conditions listed in Paragraph 4 of this Agreement.

2. Purchase Price. Seller and Purchaser agree that the total purchase price shall be ten million seven hundred fifty thousand dollars (U.S. $10,750,000), to be paid as provided in, and subject to, Paragraph 3 below (the "Purchase Price").

3. Payment of Purchase Price. The Purchase Price for the Property shall be payable as follows:

(a) As agreed to in that certain Employment Agreement between Seller and Purchaser of even date herewith ("**Employment Agreement**"), at Closing (as hereinafter defined), Purchaser shall deliver to Seller a duly executed (i) Employment Agreement and (ii) Deed of Trust to the Property in the principal amount of ten million seven hundred fifty thousand dollars ($10,750,000)**.** The Employment Agreement and Deed of Trust are attached hereto as **Exhibit 2** and **Exhibit 3** respectively and are incorporated herein by this reference. Purchaser covenants with and warrants to the Seller that the Deed of Trust shall constitute a first priority lien or encumbrance and that there are and will be no senior liens or encumbrances against the Property. As agreed to in the Employment Agreement, during the ten (10) year period starting on the Employment Commitment Date (as defined in the Employment Agreement) and ending one hundred twenty (120) months thereafter (the "**Repayment Period**") the principal balance of the Deed of Trust will be decreased on a quarterly basis consistent with the Purchaser's compliance with its Employment Commitment as set forth in Section 4 of the Employment Agreement. The

format of the Deed of Trust shall be prepared by the Seller and shall require the consent of the Purchaser, which consent shall not be arbitrarily withheld, conditioned or delayed.

4. Real Property Taxes. General real property taxes and assessments for tax year 2026, if any, shall be the sole and absolute responsibility of the Purchaser and be paid at Closing by the Purchaser on the basis of the 2025 tax year.

5. Title Commitment and Policy. Within ten (10) days of the date hereof and, in any event, at least twenty (20) days prior to the Closing Date, Purchaser shall order and obtain, and deliver to Seller, at Buyer's expense, a current commitment for extended coverage title insurance in the amount of the Purchase Price, together with legible copies of all documents listed as exceptions therein, and a current certificate of taxes due with respect to the Property, from a title company selected by Seller, and reasonably acceptable to Seller, authorized to issue title insurance in the state of Colorado (the "**Title Company**"), on the current standard form of extended ALTA Owners Policy (collectively, the "**Title Commitment**"). The Title Company shall promptly provide copies of any amendments or modifications of the Title Commitment to Seller and Purchaser. Purchaser shall have the right to review the Title Commitment, the title documents and the survey and notify Seller in writing of any title objections to the title exceptions set forth in the Title Commitment and any objections to items shown on the survey. Seller shall have five (5) days from receipt of notice of such objections within which to eliminate or modify (or agree in writing to so eliminate or modify) any such unacceptable exceptions or items to the reasonable satisfaction of Purchaser, but Seller shall have no obligation whatsoever to so eliminate or modify any such unacceptable exceptions or items. In the event that Seller is unable or unwilling to eliminate or modify (or agree in writing to so eliminate or modify) such unacceptable items to the reasonable satisfaction of Purchaser on or before the expiration of said five (5) day period, Seller shall notify Purchaser in writing of such fact within said five (5) day period or be deemed to have so notified Purchaser with respect to all such unacceptable items not theretofore cured upon the fifth (5th) day of said period. In such event, Purchaser shall, prior to the Closing Date either (i) waive such objections and accept title to the Property subject to title exceptions set forth in the Title Commitment and items shown on the survey to which Purchaser did not object and to such unacceptable items (the "**Permitted Exceptions**"), or (ii) terminate this Agreement by written notice to Seller, whereupon this Agreement shall automatically be terminated and of no further force and effect, except as otherwise expressly set forth herein. At Closing or as soon as reasonably practicable after Closing, the Title Company shall issue and deliver to Purchaser the owner's title insurance policy referred to above (the "**Title Policy**"), issued by the Title Company insuring Purchaser's title to the Property consistent with the Title Commitment subject only to taxes and assessments for the year of Closing and subsequent years, and the Permitted Exceptions. At Closing, Purchaser shall pay the premium for the Title Policy. Purchaser may obtain such other endorsements to the Title Policy as Purchaser desires, at the expense of Purchaser, except for endorsements obtained at Seller's cost. Seller shall provide such affidavits or certificates, and pay such expenses, as may be required by the Title Company to remove all liens, including, without limitation, mechanics' or materialmen's liens, as exceptions to the Title Policy.

6. Closing Time and Place. Closing of the transaction contemplated hereby ("**Closing**") shall be held at the offices of Land Title, 503 N. Main St., Ste. 2, Pueblo, Colorado

81003 at a date and time as agreed by Seller and Purchaser. Each of the parties hereby authorizes Land Title to close this transaction and each agrees to be responsible for one-half (1/2) of the closing fee charged by Land Title.

7. Closing Costs. All other costs and expenses incident to this transaction and the Closing thereof shall be paid by the party incurring same.

8. Leases or other Contracts. Seller warrants that there are no leases, contracts or agreements applicable to or affecting the Property, entered into by Seller, and that to the best of Seller's actual knowledge there are no other leases, contracts or agreements entered into by any third party applicable to or affecting the Property, which are or will be in force and effect on the date of Closing.

9. Disclaimers. EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT, IT IS UNDERSTOOD AND AGREED THAT SELLER IS NOT MAKING AND HAS NOT AT ANY TIME MADE ANY WARRANTIES OR REPRESENTATIONS OF ANY KIND OR CHARACTER, EXPRESS OR IMPLIED, WITH RESPECT TO THE PROPERTY, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OR REPRESENTATIONS AS TO HABITABILITY, MERCHANTABILTY, FITNESS FOR A PARTICULAR PURPOSE, TITLE (OTHER THAN SELLER'S SPECIAL WARRANTY OF TITLE TO BE SET FORTH IN THE SPECIAL WARRANTY DEED), ZONING, TAX CONSEQUENCES, PHYSICAL OR ENVIRONMENTAL CONDITION (INCLUDING, BUT NOT LIMITED TO, HAZARDOUS MATERIALS CONTAMINATION), UTILITIES, OPERATING HISTORY OR PROJECTIONS, VALUATION, GOVERNMENTAL APPROVALS, THE COMPLIANCE OF THE PROPERTY WITH GOVERNMENTAL LAWS, OR ANY OTHER MATTER OR THING REGARDING THE PROPERTY. PURCHASER ACKNOWLEDGES AND AGREES THAT, EXCEPT AS EXPRESSLY SET FORTH IN THIS AGREEMENT AND THE SPECIAL WARRANTY OF TITLE TO BE SET FORTH IN THE SPECIAL WARRANTY DEED, UPON CLOSING SELLER SHALL SELL AND CONVEY TO PURCHASER AND PURCHASER SHALL ACCEPT THE PROPERTY "AS IS, WHERE IS, WITH ALL FAULTS." PURCHASER AND SELLER AGREE THAT THE PROVISIONS OF THIS PARAGRAPH 9 SHALL SURVIVE THE CLOSING OF THE TRANSACTION CONTEMPLATED BY THIS AGREEMENT AND THE RECORDING OF THE SPECIAL WARRANTY DEED HEREUNDER.

10. Seller and Purchaser agree that the provisions of this Agreement shall survive Closing and the recording of the Deed.

11. All understandings and agreements heretofore had between the parties hereto are merged into this Agreement and the Employment Agreement, which together fully and completely express their agreement, and this Agreement and the Employment Agreement are entered into after full investigation, neither party relying upon any statement or representation, not embodied in this Agreement or the Employment Agreement, made by the other.

12. This Agreement may not be changed or terminated orally.

13. The provisions in this Agreement are to apply to and bind, and inure to the benefit of, the heirs, executors, administrators, successors, and assigns of the respective parties.

14. If any provision of this Agreement is determined by a court of competent jurisdiction to be invalid or unenforceable, the remainder of this Agreement shall nonetheless remain in full force and effect.

15. Applicable Law. THIS AGREEMENT SHALL IN ALL RESPECTS BE GOVERNED BY, AND CONSTRUED IN ACCORDANCE WITH, THE LAWS OF THE STATE OF COLORADO. SELLER AND PURCHASER HEREBY IRREVOCABLY SUBMIT TO THE JURISDICTION OF THE DISTRICT COURT, PUEBLO COUNTY, STATE OF COLORADO IN ANY ACTION OR PROCEEDING ARISING OUT OF OR RELATING TO THIS AGREEMENT AND HEREBY IRREVOCABLY AGREE THAT ALL CLAIMS IN RESPECT OF SUCH ACTION OR PROCEEDING SHALL BE HEARD AND DETERMINED IN THE DISTRICT COURT OF PUEBLO COUNTY, STATE OF COLORADO. PURCHASER AND SELLER AGREE THAT THE PROVISIONS OF THIS PARAGRAPH 15 SHALL SURVIVE THE CLOSING OF THE TRANSACTION CONTEMPLATED BY THIS AGREEMENT AND THE RECORDING OF THE SPECIAL WARRANTY DEED HEREUNDER. TO THE FULL EXTENT PERMITTED BY LAW, PURCHASER AND SELLER WAIVE THEIR RIGHTS TO A TRIAL BY JURY.

16. The provisions of this Agreement and of the documents to be executed and delivered at Closing are and will be for the benefit of Seller and Purchaser, and their respective heirs, executors, administrators, successors and assigns only and are not for the benefit of any third party, and accordingly, no third party shall have the right to enforce the provisions of this Agreement or of the documents to be executed and delivered at Closing.

17. The following schedules or exhibits attached hereto shall be deemed to be an integral part of this Agreement:

Exhibit 1 – Form of Special Warranty Deed
Exhibit 2 – Employment Agreement
Exhibit 3 – Form Deed of Trust

18. The section headings appearing in this Agreement are for convenience of reference only and are not intended, to any extent and for any purpose, to limit or define the text of any section or any subsection hereof.

19. The parties acknowledge that the parties and their counsel have reviewed and revised this Agreement and that the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement or any exhibits or amendments hereto.

20. The waiver or failure to enforce any provision of this Agreement shall not operate

as a waiver of any future breach of any such provision or any other provision hereof.

21. Neither party shall record this Agreement or any short form memorandum of this Agreement.

Executed at Pueblo, Colorado, the day and year first above written.

SELLER:

CITY OF PUEBLO, CO
A MUNICIPAL CORPORATION

ATTEST BY:

By: _____
Heather Graham, Mayor

_____
City Clerk

PURCHASER:

Transportation Technology Center, Inc.
a Delaware corporation

By: _____
Name: _____
Title: _____

STATE OF _____)
) ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me this ____ day of June, 2026 by _____ as_____of Transportation Technology Center, Inc., a Delaware corporation.

Witness my hand and official seal.

My commission expires: _____.

[S E A L]

_____
Notary Public

Exhibit 1 to
Contract to Buy and Sell Real Estate

SPECIAL WARRANTY DEED
(350 KEELER PARKWAY, PUEBLO, CO 81001)

THIS DEED, made, effective for all purposes on the ___ day of July, 2026 by and between the CITY OF PUEBLO, a Colorado municipal corporation, Grantor, for and in consideration of the sum of TEN DOLLARS ($10.00) in hand paid by, the, Grantee, hereby sells and conveys to, Transportation Technology Center, Inc., a Delaware corporation, Grantee, whose address is 350 Keeler Parkway, Pueblo, CO 81001, the following real property situate in the County of Pueblo, State of Colorado, to-wit:

Lot 33, Pueblo Memorial Airport Industrial Park
Subdivision, County of Pueblo, State of Colorado

more commonly known by street and number as: 350 Keeler Pkwy., Pueblo, CO 81001.

TOGETHER with all and singular the hereditaments and appurtenances thereto, belonging, or in any otherwise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, and all of the estate, right, title, interest, claim, and demand whatsoever of the Grantor, either in law or in equity, of, in, and to the above bargained premises with the hereditaments and appurtenances.

TO HAVE AND TO HOLD the said premises above bargained and described with the appurtenances, unto the Grantee, its successors and assigns forever. Grantor for itself and its successors and/or assigns do covenant and agree that it shall and will warrant and forever defend the above bargained premises in the quiet and peaceful possession of the Grantee, its successors and assigns, against all and every person or persons claiming the whole or any part thereof, by, through or under the Grantor. The singular number shall include the plural and the plural the singular and the use of any gender shall be applicable to all genders. Said warranty is subject to rights-of-way, easements, covenants, plats, agreements and other restrictions of record as of the date of this Deed and any other exceptions or exclusions or rights of third parties not shown by the public records of which Grantee has actual knowledge, and to the inclusions of the property within any special taxing district.

IN WITNESS WHEREOF, the Grantor has executed this Deed on the date set forth above.

CITY OF PUEBLO, a Colorado municipal corporation

_____
Heather Graham
Mayor

STATE OF COLORADO)
) ss
COUNTY OF PUEBLO)

Subscribed and sworn to before me this _____ day of July, 2026 by Heather Graham, Mayor of the City of Pueblo, a Colorado municipal corporation.

Witness my hand and official seal.
My commission expires: _____

_____
Notary Public

Exhibit 2
to
Contract to Buy and Sell Real Estate

EMPLOYMENT AGREEMENT

THIS EMPLOYMENT AGREEMENT ("Agreement") is entered into this 22nd day of June, 2026 by and between the City of Pueblo, a Colorado municipal corporation (the "City") and Transportation Technology Center, Inc. dba MxV Rail, a Delaware corporation (the "Company"). The Company and the City are referred to collectively in this Agreement as the "Parties" and individually, without differentiation, each as a "Party."

WHEREAS, the Company has established a transportation technology center and business administration office at the City's Airport Industrial Park pursuant to an Employment Agreement dated May 10, 2021 ("2021 Employment Agreement");

WHEREAS, as part of the 2021 Employment Agreement the Company leased the real property located at 350 Keeler Parkway located within the City's Airport Industrial Park the Company and has met all the requirements of the 2021 Employment Agreement;

WHEREAS, in addition to meeting all the requirements of the 2021 Employment Agreement, the Company invested approximately $7,000,000 of its own funds into improvements to the property at 350 Keeler Parkway;

WHEREAS, the Company desires to maintain and expand its transportations technology center and business administration office at 350 Keeler Parkway;

WHEREAS, the Company brings 1500 to 2000 people to the community every year for emergency response training who indirectly benefit the community and through indirect revenues;

WHEREAS, the Company has made application for additional economic incentives from the City; and

WHEREAS, the Mayor and City Council has approved such application and will make incentives available to Company subject to and upon the terms and conditions of this Agreement; and

WHEREAS, the City has determined that Company's Business will retain and create primary jobs and will not materially and substantially compete with any existing activity or business within the City; and

WHEREAS, in connection with its application, City recognizes (i) the prior investment of approximately Seven Million Dollars ($7,000,000) in fixed assets in the transportation technology

center and business administration offices and (ii) the employment described in Section 4 of this Agreement.

NOW, THEREFORE, in consideration of the foregoing recitals and the mutual covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, City and Company agree as follows:

1. The following terms as used in this Agreement shall have the following meanings unless the context clearly indicates otherwise:

"Property Contract" means the Contract to Buy and Sell Real Estate dated June 30, 2026 and relating to the Property commonly known as 350 Keeler Parkway, Pueblo, CO 81001.

"Employment Commitment Date" means July 1, 2026.

"Facility" means the current building and real property located at the Pueblo Memorial Airport Industrial Park, having a street address of 350 Keeler Parkway, Pueblo, Colorado, 81001, wherein Company will conduct its business operations.

"Full-Time Employee" means a person, based out of the Facility, who performs work for the Company for not less than thirty-five (35) hours per week at an average annual salary of not less than $92,000 per year plus benefits, employed by the Company or new employees hired as a result of recruiting.

"Per Employee Payment" means an amount equal to (a) the Total Funds Advanced *divided by* 200 (i.e. the Full Time Employees subject to the Employment Commitment), *divided by* (b) 40 (i.e. the number of Quarters in the Repayment Period).

"Property" means the real property in Pueblo County, Colorado having the following legal description:

LOT 33, PUEBLO MEMORIAL AIRPORT INDUSTRIAL PARK
SUBDIVISION, COUNTY OF PUEBLO, STATE OF COLORADO

also known by street and number as 350 Keeler Parkway, Pueblo, CO 81001.

"Quarter" means three consecutive calendar months commencing January 1, April 1, July 1 and October 1 of each calendar year.

"Quarterly Employees" means the sum of the aggregate number of Full -Time Employees on each business day of a Quarter, divided by the number of business days in such Quarter.

"Repayment Reduction" means for each Quarter an amount equal to the Total Funds

Advanced *divided by* 40 (i.e. the number of Quarters in the Repayment Period). For example, if the Total Funds Advanced equals $1,462,000, the Repayment Reduction would be $1,462,000.00 ÷ 40 = $36,550.00

2. In consideration for this Agreement, the City shall transfer the Property to Company pursuant to the Property Contract dated June 30, 2026. The Property is currently valued at $10,750,000 pursuant to an appraisal dated June 2026. For the purposes of this Agreement, the "Total Funds Advanced" or "City Funds" shall be equal to the value of the Property as determined by the appraisal dated June 2026. The Total Funds Advanced shall be a debt owed to the City secured by a Deed of Trust to the Property. If Company is not in default under this Agreement, City will reduce to or for the benefit of Company the total Funds Advanced on a quarterly basis (each such reduction, a "Funds Reduction" and all such cumulative reductions the "Total Funds Reductions"), subject to and contingent upon the following conditions and covenants which Company agrees to perform and comply with:

(a) Company shall comply with all terms and conditions of the Property Contract. So long as Company has complied with all terms and conditions of this Agreement and the Property Contract, the "closing" of the sale of the Facility by City to Company shall take place within thirty (30) days of approval of this Employment Agreement and the Property Contract.

(b) Within fourteen (14) days of the date of this Agreement, Company shall file in the office of the City Clerk copies of the following:

(i) Company's certificate or other evidence of authority to transact business in the State of Colorado issued by the Colorado Secretary of State,
(ii) certified copies of the resolutions of the governing board of Company approving this Agreement and the Property Contract and authorizing its officers to execute and deliver said documents in the name of Company, and
(iii) this Agreement and the Property Contract executed by authorized officers of Company.

The date of the last to occur of the filings required under (i), (ii) and (iii) of this Section 2(b) shall be referred to herein as the "Closing." If Closing does not occur on or before July 30, 2026, or such later date as Company and City shall mutually agree, City, at its sole option, may terminate this Agreement and City and Company shall thereafter be released and discharged from all obligations hereunder.

(c) Upon reasonable prior notice and during normal business hours, Company shall permit representatives of the City of Pueblo Finance Department access to and the right to examine Company's books, records, accounts, personnel, and other sources of information as may be relevant to determine whether Company is complying with the Agreement in accordance with

the Agreement, Pueblo Municipal Code and all applicable laws.

3. Company acknowledges and agrees that the primary purpose of City in entering into this Agreement and the sole benefit to the City for making City Funds available to Company hereunder is the creation of jobs. Therefore, Company represents, covenants, and agrees that it will after the date of this Agreement continuously conduct its business operations and employ Full - Time Employees at the Facility as follows:

(a) During the period from the date of this Agreement to the Employment Commitment Date, Company shall use its commercially reasonable efforts in good faith to employ residents of Pueblo County as Full-Time Employees, as reasonably justified by its business operations, including without limitation, engaging in reasonable programs and posting of employment openings in the City; and

(b) On and after the Employment Commitment Date, Company shall employ not less than Two Hundred (200) Full-Time Employees at the Facility (the "Employment Commitment"), with an average annual salary of Ninety-two Thousand dollars $92,000 plus benefits; and

(c) To the extent reasonably possible, engage engineers, architects, contractors and suppliers whose principal places of business are located in Pueblo County, Colorado, in all construction work for or related to the Facility.

4. Notwithstanding anything contained in this Agreement to the contrary, if Company shall for any reason default in its Employment Commitment set forth in Paragraph 3, Company shall repay to City a pro-rata share of the Total Funds Advanced by City under Paragraph 2 hereof based upon the number of Full-Time Employees employed by Company at the Facility (the "Repayment Obligation"), as follows:

(a) During the ten (10) year period starting on the Employment Commitment Date and ending one hundred twenty (120) months thereafter (the "Repayment Period"), Company shall pay to City an amount each Quarter equal to the Quarterly Employees less than Two Hundred (200) Full -Time Employees based at the Facility by Company multiplied by the Per Employee Payment (the "Company's Quarterly Payments"). For example, if for the second Quarter of the third year after the Employment Commitment Date the Total Funds Advanced equals $1,462,000 and such Quarterly Employees is 100, the amount payable by Company to City on or before the fifteenth (15th) day of the next calendar month would be (200 - 100) x $182.75 = $18,275.00.

(b) Company's Quarterly Payments, if any, shall be paid to the City without notice, demand, deduction or setoff on or before the fifteenth (15th) day of the month after the end of each Quarter during the Repayment Period and for one month thereafter at the office of the Director of Finance of City, 101 W. Riverwalk Place, 3rd Floor, Pueblo, Colorado, 81003, or such other person or location as the City may designate. All past due Company's Quarterly Payments

shall bear interest at the rate of eight percent (8%) per annum ("Default Rate") until paid.

(c) Within fifteen (15) days after the end of each Quarter after the Employment Commitment Date and for one calendar month after the Repayment Period, Company will submit to City's Director of Finance Company's statements showing the Quarterly Employees and their aggregate salaries for the preceding Quarter and the basis upon which Quarterly Employees and Company's Quarterly Payment, if any, were computed, certified by an officer of the Company to be true and correct. For purposes of verifying such employment, City shall have access to Company's records relating to Company's employees employed by the Company. City shall treat such information as confidential and shall not disclose (except pursuant to a subpoena or court order) such information to any party other than those City employees who have a need to know such information. In the event that (i) City receives a subpoena or court order the City determines requires disclosure of Company's employment records, or (ii) City otherwise determines that City is legally required to disclose such employment records, City agrees to provide Company with prompt written notice of any such requirement such that the Company may seek, at its expense, a protective order or other appropriate remedy.

(d) Subject to the provisions of Paragraph 6, if Company defaults in the performance of its Repayment Obligation and such default is not cured within sixty (60) days after written notice specifying the default is given by City to Company, then in such event, City may declare the Repayment Obligation due and owing together with interest thereon from the date of default at the Default Rate, and for such purpose, the entire balance of Company's Repayment Obligation shall be the amount calculated pursuant to Paragraph 4(a). Company's Repayment Obligation is absolute and unconditional and shall not be abated, reduced, diminished, modified, withheld, or otherwise offset for any cause or reason whatsoever.

(e) Except as otherwise provided in Paragraphs 7 and 13 hereof, City's damages for breach of Company's Employment Commitment or Repayment Obligation shall not exceed Total Funds Advanced plus interest and costs of collection including reasonable attorneys' fees, provided, however, that the Total Funds Advanced shall be reduced by the Repayment Reduction for each Quarter Company meets its Repayment Obligation during the Repayment Period by either (i) employing two hundred (200) Quarterly Employees based at the Facility, or (ii) paying Company's Quarterly Payments as provided in Paragraph 4(a) above for such Quarter.

5. All City Funds advanced to Company by City under this Agreement shall be deemed to be a debt of Company payable to City until Company performs and discharges its obligations hereunder including its Repayment Obligation contained in Paragraph 4. The Company's performance under this Agreement including its Repayment Obligation contained in Paragraph 4 shall be secured by a Deed of Trust encumbering the Facility and Property. Company covenants with and warrants to the City that the Deed of Trust shall constitute a first priority lien or encumbrance and that there are and will be no senior liens or encumbrances against the Facility and Property. The form and content of the Deed of Trust shall be subject to the prior reasonable approval of counsel for the City and the Company.

6. (a) Prior to instituting any proceeding to enforce Company's Repayment Obligation under Paragraph 4, City shall notify Company in writing of its intention to institute such proceedings. Company may request relief from its Repayment Obligation by delivering to City within thirty (30) days after date of City's notice, Company's written request for relief specifying the grounds upon which such relief is sought together with documents supporting said grounds. Within ninety (90) days after receipt of Company's request, City will schedule a meeting with the City Council at which Company must appear. City will notify Company of the time and place of the meeting at least ten (10) days before the meeting. Failure of Company to timely deliver its complete written request for relief or to appear at the scheduled meeting with the City Council shall entitle City to immediately institute proceedings to enforce Company's Repayment Obligation.

(b) City Council may or may not, in its sole and absolute discretion, relieve Company, in whole or in part, from Company's Repayment Obligation. Any action taken by the City Council relating to a request for relief shall be final and binding on Company, and shall not be subject to judicial review. Any such action by City Council is, and shall constitute, a legislative measure. Nothing contained in this Paragraph 6 shall grant or be construed to grant to Company any right or claim to relief from its Repayment Obligation or a hearing with respect thereto.

(c) No delay by the City in scheduling a meeting, or failure by City to exercise its right to enforce this Agreement, including Company's Repayment Obligation, and no partial or single exercise of that right, shall constitute a waiver of that right.

7. In the event of any litigation arising under this Agreement, the court shall award to, and the prevailing party shall recover its costs together with all internal and out-of-pocket expenses of any kind relating to the litigation including, but not limited to, reasonable attorney fees. Exclusive venue for any such litigation shall be in Pueblo County, Colorado. All such litigation shall be filed in the District Court, County of Pueblo, State of Colorado and each party hereby submits to the jurisdiction of such District Court. To the full extent allowed by law, each party waives its right to a jury trial.

8. This Agreement expresses the entire understanding of the parties and supersedes and abrogates any and all prior dealings and commitments, whether oral or written, with respect to the subject matter of this Agreement and may not be amended or modified except in writing signed by City and Company. Any waiver of any provision of this Agreement must be in writing and signed by the party whose rights are being waived. No waiver of any breach of any provision hereof shall be or be deemed to be a waiver of any preceding or subsequent breach of the same or any other provision of this Agreement. The failure of either party to enforce or seek enforcement of the terms of this Agreement following any breach shall not be construed as a waiver of such breach.

9. This Agreement shall be construed in accordance with and be governed by the laws of the State of Colorado without regard to conflict of law principles.

10. Any notices hereunder shall be sufficiently given if given in writing personally or mailed by first class, registered, or certified mail, postage prepaid, addressed:

(a) if to City, Mayor, City of Pueblo, 1 City Hall Place, 2nd Floor, Pueblo, Colorado, 81003, with copy to City Attorney, 101 W. Riverwalk Place, 4th Floor, Pueblo, Colorado, 81003, or

(b) if to the Company, Attn: Tammy Bregar, 350 Keeler Parkway, Pueblo, Colorado, 81001.

or to such other person or address as either party shall specify in written notice given to the other party pursuant to the provisions of this Paragraph 10. Notice shall be effective (i) upon receipt if delivered personally, or (ii) three (3) business days after deposit in the mails, if mailed.

11. Time is of the essence hereof. This Agreement shall be binding upon and inure to the benefit of the parties and their respective successors and assigns, provided Company may not assign this Agreement or any interest herein without the express written consent of the City, which may be granted or denied at its sole and absolute discretion. Any assignment or attempted assignment of this Agreement by Company without such consent shall be null and void. No assignment of this Agreement or any interest herein by Company shall release or discharge Company from any of its obligations under this Agreement unless otherwise agreed by City at the time consent to assignment is given.

12. The persons signing this Agreement in the name of and on behalf of Company represent and warrant that they and Company have the requisite power and authority to enter into, execute, and deliver this Agreement, and that this Agreement is a valid and legally binding obligation of Company enforceable against Company in accordance with its terms.

13. Company represents and warrants that no person, entity, or organization has been employed or retained or will receive or be paid, directly or indirectly, any commission, percentage, contingent fee or any other remuneration payment or receipt of which is contingent upon approval of this Agreement by City or City's advancement of City Funds to Company hereunder. For breach or violation of this warranty, City shall have the right to terminate this Agreement, or recover the full amount of such commission, percentage, contingent fee or other remuneration, or to seek such other remedies legally available to City, which remedies shall be cumulative.

14. In no event shall City, its officers, agents or employees be liable to Company for damages, including without limitation, compensatory, punitive, indirect, special or consequential damages, resulting from or arising out of or related to this Agreement or the performance or breach thereof by City or the failure or delay of City in the performance of any covenant or provision under this Agreement on its part to be performed. In consideration of City entering into this Agreement, Company hereby waives and discharges City, its officers, agents and employees from all claims for any and all such damages. No breach, default, delay or failure of City under this Agreement shall

be or be construed to be a waiver, discharge or release of Company's Repayment Obligation under Paragraph 4 hereof with respect to the amount of City Funds actually advanced or paid by City to or for the benefit of Company pursuant to Paragraph 2 hereof.

15. In no event shall either Party, their respective officers, agents, or employees be liable to the other for punitive damages resulting from or arising out of the breach of this Agreement or the failure or delay in the performance of any covenant or provision under this Agreement.

16. If any provision of this Agreement is declared by a court of competent jurisdiction to be invalid or unenforceable, such determination shall not affect the other provisions of this Agreement which shall remain in full force and effect.

17. Neither party shall be, or hold itself out as, agent of the other or as partners or joint venturers under this Agreement.

18. Each party acknowledges that this Agreement was fully negotiated by the parties and, therefore, no provision of this Agreement shall be interpreted against any party because such party or its legal representative drafted such provision.

19. The provisions of this Agreement are for the exclusive benefit of the parties hereto and their successors and permitted assigns, and no third party shall be a beneficiary, or have any rights by virtue of, this Agreement.

20. This Agreement may be executed in any number of counterparts, and each such counterpart shall be deemed for all purposes to be an original, and all such counterparts shall together constitute but one and the same original.

[INTENTIONAL LEFT BLANK – SIGNATURE PAGE FOLLOWS]

City of Pueblo, Colorado

a Colorado Municipal Corporation

[S E A L]

Attest:_____ By_____
City Clerk Heather Graham, Mayor

Transportation Technology Center, Inc.
a Delaware corporation

By: _____
Name: _____
Title: _____

STATE OF COLORADO)
) ss.
COUNTY OF PUEBLO)

The foregoing instrument was acknowledged before me this ____ day of June, 2026 by _____ as_____of Transportation Technology Center, Inc., a Delaware corporation.

Witness my hand and official seal.

My commission expires: _____.

[S E A L]

_____
Notary Public

Exhibit 3
to
Contract to Buy and Sell Real Estate

DEED OF TRUST

THIS INDENTURE (the "Deed of Trust") is made this ____ day of July, 2026, by and between Transportation Technology Center, Inc., a Delaware corporation, whose address is 350 Keeler Parkway, Pueblo, Colorado 81001 (hereinafter referred to as "Borrower") and the Public Trustee of Pueblo County, State of Colorado (hereinafter referred to as "Trustee").

W I T N E S S E T H:

WHEREAS, Borrower has executed an Employment Agreement with the City of Pueblo, a Colorado municipal corporation (“Lender”) dated June 22, 2026 (the “Employment Agreement”) whereby Company agreed to pay to Lender, as a repayment obligation, if Borrower fails to meet its employment commitment, a principal sum in an amount not to exceed ten million seven hundred fifty thousand dollars and no/cents ($10,750,000) (“Repayment Obligation”); and

WHEREAS, Borrower desires to secure the prompt payment of the aforesaid Repayment Obligation;

NOW, THEREFORE, in consideration of ten million seven hundred fifty thousand dollars and no/cents ($10,750,000) and other good and valuable consideration and for the purpose aforesaid, Borrower hereby grants, bargains, sells and conveys unto Trustee in trust forever the real property located in the City of Pueblo, Pueblo County, Colorado, described in Exhibit A attached hereto and incorporated by reference herein, and all of Borrower's right, title and interest therein.

This Deed of Trust includes, and Borrower hereby grants, bargains, sells and conveys unto Trustee in trust forever, all buildings, structures and improvements now or hereafter placed thereon, all fixtures now or hereafter attached thereto and all the rights (including water rights), permits, hereditaments and appurtenances thereto belonging or in any way appertaining, together with any after acquired property interest in the above described property and real estate which Borrower may at any time hereafter have or acquire, and also all of the rents, issues, uses, profits and income of the above described real estate and mortgaged property from now until the Repayment Obligation secured hereby is paid in full or Borrower has completed its employment commitment. All the above-described property is herein referred to as the "Mortgaged Property".

Trustee shall have and hold the Mortgaged Property, together with all the privileges and appurtenances thereunto belonging: In trust nevertheless, in case of default by Borrower hereunder, then upon notice and demand in writing filed with the Trustee as provided by law, it shall and may be lawful for Trustee to foreclose this Deed of Trust, and to sell and dispose of the

Mortgaged Property (or any part thereof as may be designated in the notice of such sale) and all the right, title and interest of Borrower therein, in the manner as may then be provided by law, and to issue, execute and deliver his certificate of purchase, trustee's deed or certificate of redemption all as then may be provided by law. Trustee shall, out of the proceeds or avails of such sale, after first paying and retaining all fees, charges, the costs of making said sale and advertising the Mortgaged Property, and attorney's fees as herein provided, pay to Lender the amount of such indebtedness, and all moneys advanced by Lender for any purpose authorized herein or by law, with interest thereon at the Applicable Interest Rate as set forth in Section 4(b) of the Employment Agreement, rendering the over plus, if any, as provided by applicable law. The sale or sales and said deed or deeds so made shall be a perpetual bar, both in law and equity, against Borrower and all other persons claiming the Mortgaged Property or any part thereof by, from, through or under Borrower. The legal holder of the indebtedness may purchase the Mortgaged Property or any part thereof and it shall not be obligatory upon the purchaser or purchasers at any such sale to see to the application of the purchase money. If a release deed is required, Borrower hereby agrees to pay all the expenses thereof.

Borrower hereby warrants title to the Mortgaged Property, subject only to taxes not yet due and payable and to those matters specified in Exhibit B attached hereto and incorporated herein by reference.

Borrower hereby further covenants, acknowledges and agrees to perform the Repayment Obligation set forth in Section 4 of the Employment Agreement.

Borrower agrees to and shall promptly pay all costs, charges and expenses incurred by Lender, including reasonable attorneys' fees arising out of or in connection with any action, proceeding or hearing, in any way affecting or relating to the Mortgaged Property or the above-described Employment Agreement with Lender.

Upon the occurrence of default in the timely performance of Borrower’s Repayment Obligations under the Employment Agreement with Lender, the whole of the indebtedness secured hereby and the interest thereon may at once, at the option of Lender, be declared immediately due and payable, and the Mortgaged Property may be sold in the manner and with the same effect as if the indebtedness had matured and remained unpaid after maturity. If foreclosure is made by Trustee, a reasonable attorney's fee for services in the supervision of such foreclosure proceedings shall be allowed and added by Trustee as a part of the cost of foreclosure. If foreclosure be by action in court, reasonable attorneys' fees shall be taxed by the court as part of the cost of such foreclosure proceedings. All such reasonable attorneys' fees as well as the costs, charges and expenses, shall be and become a part of the indebtedness secured hereby.

If the Mortgaged Property, or any part thereof, is sold (whether by land contract or otherwise), conveyed or transferred, the entire indebtedness secured hereby shall become immediately due and payable, at Lender's option, unless written consent for such sale, conveyance or transfer has been obtained from Lender.

Time is of the essence hereof.

This Deed of Trust shall be interpreted, construed and enforced according to the laws of the State of Colorado.

IN WITNESS WHEREOF, Borrower executed this Deed of Trust on the day and year first appearing above.

BORROWER:

Transportation Technology Center, Inc.
a Delaware corporation

By: _____
Name: _____
Title: _____

STATE OF _____)
) ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me this ____ day of July, 2026 by _____ as_____of Transportation Technology Center, Inc., a Delaware corporation.

Witness my hand and official seal.

My commission expires: _____.

[S E A L]

_____
Notary Public

EXHIBIT A

Legal Description

LOT 33, PUEBLO MEMORIAL AIRPORT INDUSTRIAL PARK SUBDIVISION, COUNTY OF PUEBLO, STATE OF COLORADO

also known by street and number as 350 Keeler Parkway, Pueblo, CO 81001.

EXHIBIT B

Prior Encumbrances

None.

Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Andra Ahrens, Director Wastewater

SUBJECT: A RESOLUTION AWARDING A CONSTRUCTION CONTRACT IN THE AMOUNT OF $759,970.00 TO MILLER PIPELINE LLC FOR PROJECT NO. 26-028 (WWAN05) 2026 MANHOLE REHABILITATION PROJECT, SETTING FORTH $151,994.00 FOR CONTINGENCIES AND AUTHORIZING THE PURCHASING AGENT TO EXECUTE THE SAME

SUMMARY:

During routine maintenance on the sanitary mains by the collection crew, an evaluation of the manholes is also performed to determine the severity of deterioration. The manholes are ranked using the National Association of Sewer Service Companies (NASSCO) evaluation criteria – the higher the ranking, the worse the deterioration. Manholes for the 26-028 (WWAN05) FY2026 Manhole Rehabilitation Project had to meet the requirement of being the highest ranking on the manhole evaluation list. To protect the public interest, these manholes require rehabilitation by trenchless or open-cut methods.

PREVIOUS COUNCIL ACTION:

None

BACKGROUND:

During routine inspection of the sanitary mains, an evaluation of the manholes, manhole benches and troughs is performed to determine the severity of deterioration in the manhole structures and to prioritize them accordingly. The manholes chosen for the 26-028 (WWAN05) FY2026 Manhole Rehabilitation Project had the highest ranking for rehabilitation.

The manholes will be rehabilitated by trenchless or open-cut methods. Trenchless methods include placing calcium aluminate and epoxy coating on the manhole walls and rebuilding the manhole benches and troughs with fast-setting cementitious

material.

FINANCIAL IMPLICATIONS:

The cost of the construction project was bid at $759,970.00 with contingencies of $151,994.00. Funds are available from the Sewer User Funds and have been budgeted and appropriated to Project No. 26-028 (WWAN05) - Manhole Rehabilitation Project.

BOARD/COMMISSION RECOMMENDATION:

Not Applicable

STAKEHOLDER PROCESS:

None

ALTERNATIVES:

Alternative No. 1 — No Action
The Wastewater Department would take no action. The manholes would continue to deteriorate until they eventually collapse, warranting an emergency repair and possibly endangering the public.

RECOMMENDATION:

Approval of the Resolution.

ATTACHMENTS:

1. 6-8-26 26-028 FY2026 Manhole Rehabilitation Project Attachment

RESOLUTION NO.

A RESOLUTION AWARDING A CONSTRUCTION CONTRACT IN THE AMOUNT OF $759,970.00 TO MILLER PIPELINE LLC FOR PROJECT NO. 26-028 (WWAN05) 2026 MANHOLE REHABILITATION PROJECT, SETTING FORTH $151,994.00 FOR CONTINGENCIES AND AUTHORIZING THE PURCHASING AGENT TO EXECUTE THE SAME

WHEREAS, competitive bids for the Project No. 26-028 (WWAN05) 2026 Manhole Rehabilitation Project have been received and examined; and

WHEREAS, the proposal of Miller Pipeline LLC of Pueblo, Colorado was the lowest of those bids determined to be responsive; NOW, THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

City Council authorizes Project No. 26-028 (WWAN05) 2026 Manhole Rehabilitation Project to be performed, and the contract for said project is hereby awarded to Miller Pipeline LLC, in the amount of $759,970.00.

SECTION 2.

Funds for Project 26-028 (WWAN05) - Manhole Rehab shall be from the Sewer User Funds.

SECTION 3.

The Purchasing Agent is hereby authorized to execute said contract on behalf of Pueblo, A Colorado Municipal Corporation, and the City Clerk shall affix the seal of the City thereto and attest the same.

SECTION 4.

In addition to the amount of the bid set forth, as aforementioned, an additional amount as stipulated in this section is hereby established for contingencies and additional work.

Contingencies and Additional Work…….$151,994.00.

SECTION 5.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Resolution and the contract to implement the transactions described therein.

SECTION 6.

This Resolution shall become effective immediately upon passage and approval.

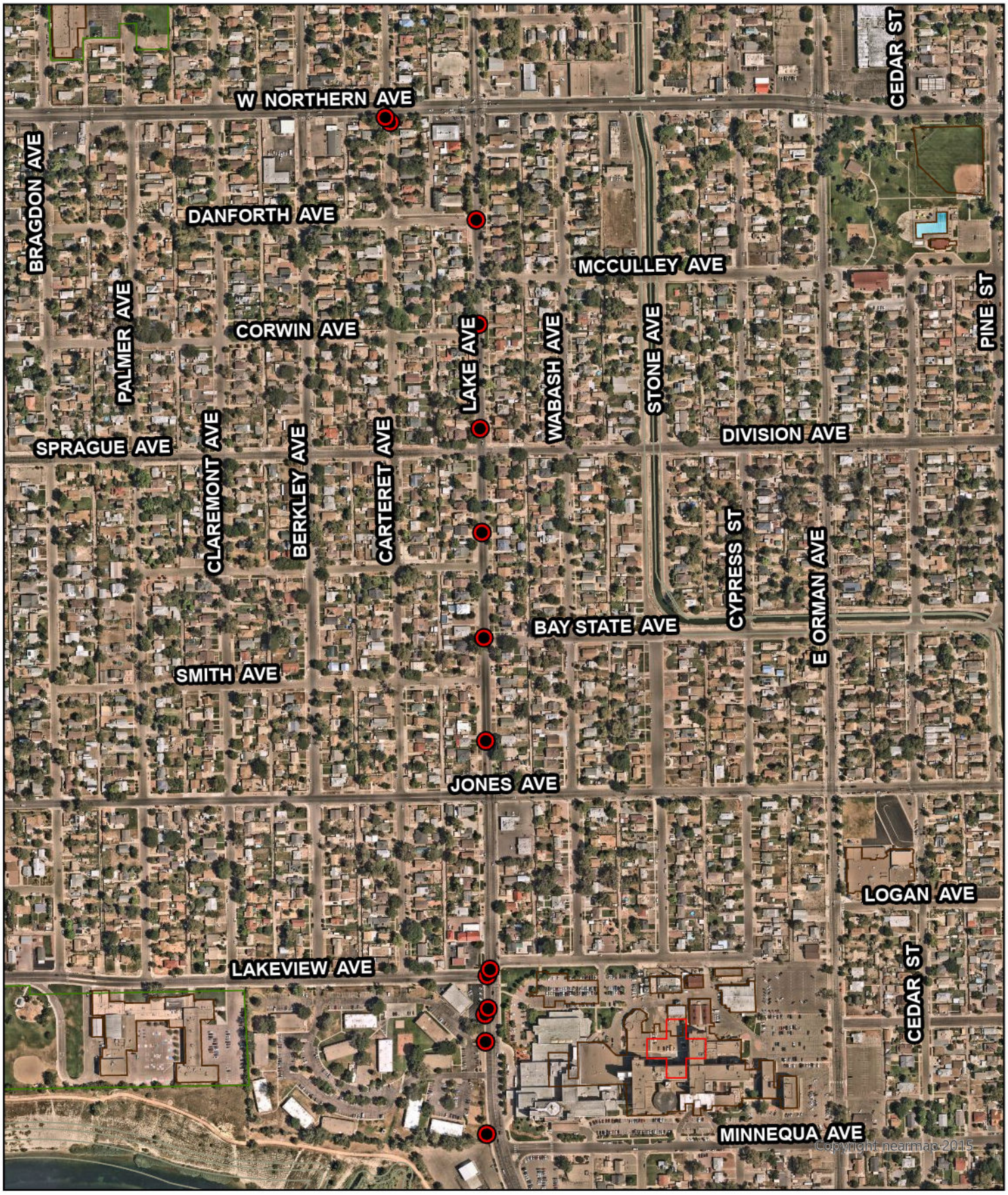
INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

2026 MANHOLE REHABILITATION PROJECT LOCATION MAP



City of Pueblo
Purchasing
Teresa May Burns, Director
230 S. Mechanic St., Pueblo, CO 81003

EVALUATION TABULATION

IFB No. 26-028 (WWAN05)

2026 Manhole Rehabilitation Project

RESPONSE DEADLINE: April 1, 2026 at 10:00 am
Report Generated: Wednesday, April 1, 2026

VENDOR TOTALS

Vendor	Total
Miller Pipeline, LLC	$759,970.00

BASE BID

Base Bid					Miller Pipeline, LLC	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
X	1	Place Epoxy Coat Ex. 48" Manhole	13	VF	$300.00	$3,900.00
X	2	Place Calcium Aluminate Ex. 48" Manhole	13	VF	$240.00	$3,120.00
X	3	Remove and Replace 48" Manhole	12	EA	$26,500.00	$318,000.00
X	4	Rebuild Manhole Bench and Trough with Fast-Setting Cementitious Material	2	EA	$1,650.00	$3,300.00
X	5	Additional Manhole Cleaning 48" Manhole	12	VF	$12.00	$144.00
X	6	Asphalt Patch – 4” HMA on 4” Class 6 ABC For 12" and 15" Pipe	432	LF	$113.00	$48,816.00
X	7	Install Extra Lean Concrete (FlowFill)	128	CY	$230.00	$29,440.00
X	8	Remove and Replace Manhole Ring and Lid	1	EA	$2,250.00	$2,250.00
X	9	Traffic Control	1	LS	$65,000.00	$65,000.00
X	10	Mobilization	1	LS	$36,000.00	$36,000.00
X	11	Bypass Pumping	1	LS	$250,000.00	$250,000.00
Total						$759,970.00

Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Dianne Danti, Councilor

SUBJECT: A RESOLUTION AUTHORIZING PAYMENT FROM THE COUNCIL CONTINGENCIES ACCOUNT IN THE 2026 GENERAL FUND BUDGET TO MARIPOSA CENTER FOR SAFETY IN THE AMOUNT OF $1,700, TO SPONSOR THE 25TH ANNUAL TRIBUTE TO WOMEN FROM 6:00-9:00 PM AT THE PUEBLO UNION DEPOT ON SATURDAY, OCTOBER 10, 2026

SUMMARY:

Attached for consideration is a request for support of Mariposa Center for Safety in the amount of $1,700 to sponsor the 25th Annual Tribute to Women from 6:00-9:00 PM at the Pueblo Union Depot on Saturday, October 10, 2026.

PREVIOUS COUNCIL ACTION:

Council supported this event in 2025 for $2,500, in 2024 for $1,000, and in 2018, 2019 and 2020 for $500.

BACKGROUND:

City Council Member Dianne Danti is requesting $2,500 to sponsor Mariposa Center for Safety's 25th Annual Tribute to Women, and applying the previously awarded sponsorship of the Ode to Chocolate event for $800 which was cancelled. The event will take place on Saturday, October 10, 2026, at 6:00 PM at the Pueblo Union Depot.

Mariposa Center for Safety is a 501(c)(3) whose mission is to empower survivors of domestic violence, family abuse, sexual assault, and human trafficking through increasing self-sufficiency and self-worth, education, prevention, victim advocacy, and by offering emergency services, provisions, and shelter. In 2025, Mariposa Center for Safety provided emergency shelter services to 533 adults and children, 7,416 meals, 2,534 shelter nights and answered 654 crisis calls.

The annual Tribute to Women is Mariposa's largest fundraiser and proceeds from ticket sales, sponsorships, and the silent auction directly support the many programs they offer, including the 24/7 crisis hotline, emergency shelter, Teresa's Place Safe Child Exchange and community education and outreach. The event recognizes exceptional women in our community who promote hope and have contributed their time, efforts, and commitment to the betterment of our community. Honorees are nominated in one of four categories: Young Leader (ages 16–21), Professional Achievement, Community Service, and Triumph Over Adversity. Nominations will open on July 15, 2026.

FINANCIAL IMPLICATIONS:

Payment of funds in the amount of $1,700 would be paid from the Council Contingencies Account in the 2026 General Fund Budget to Mariposa Center for Safety.

BOARD/COMMISSION RECOMMENDATION:

Not applicable.

STAKEHOLDER PROCESS:

Not applicable.

ALTERNATIVES:

City Council could choose not to authorize funding for this purpose.

RECOMMENDATION:

This Resolution is at the request of Council Member Dianne Danti.

ATTACHMENTS:

1. Sponsorship Request Packet - Mariposa Center for Safety - 25th Annual Tribute to Women
2. SOS - Mariposa Center for Safety - 5.5.26
3. 2026 Contingencies (Council) Mariposa Center for Safety - Tribute to Women

RESOLUTION NO.

A RESOLUTION AUTHORIZING PAYMENT FROM THE COUNCIL CONTINGENCIES ACCOUNT IN THE 2026 GENERAL FUND BUDGET TO MARIPOSA CENTER FOR SAFETY IN THE AMOUNT OF $1,700, TO SPONSOR THE 25TH ANNUAL TRIBUTE TO WOMEN FROM 6:00-9:00 PM AT THE PUEBLO UNION DEPOT ON SATURDAY, OCTOBER 10, 2026

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

Payment in the amount of $1,700 from the Council Contingencies Account in the 2026 General Fund Budget is authorized to be paid to Mariposa Center for Safety to sponsor the 25th Annual Tribute to Women at 6:00 PM at the Pueblo Union Depot on Saturday, October 10, 2026.

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Resolution to effectuate the policies and procedures described herein.

SECTION 3.

This Resolution shall become effective upon passage and approval.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

Sponsorship Request

**Please submit requests at least one month in advance to allow for adequate processing time

Requestor Name	Sandy Morrison
Date	03/13/2026
Requestor Phone	[redacted]
Requestor Email	[redacted]
Business/Organization Name	Mariposa Center for Safety
Organization Website	mariposacenterforsafety.org
Please share your business or organizations mission/goals	OUR MISSION: To empower survivors of domestic violence, family abuse, sexual assault, and human trafficking through increasing self-sufficiency and self-worth, education, prevention, victim advocacy, and by offering emergency services, provisions, and shelter. CORE VALUES : Inclusivity, respect, ethical practices, professionalism, equity, financial responsibility.
Sponsorship request for	Event
Requested Amount	800.00
Please Share the total cost to host this event last year. (If this is the first time this event has taken place. please provide the estimate total for this year.)	16000.00
Describe how contribution will be used	Due to ongoing construction, Mariposa Center for Safety cancelled the 2nd Annual Ode to Chocolate Indulgence. The City of Pueblo generously sponsored the event in the amount of $800. We request that those funds be transferred to sponsorship of the 25th Annual Tribute to Women, Oct 10, 2026, 6-9pm at the Pueblo Union Depot. The sponsorship will support the many programs at Mariposa Center for Safety, including the 24/7 crisis hotline, emergency shelter, Teresa's Place Safe Child Exchange and community education and outreach.
Event Title	[redacted]
Event Date	10/10/2026
Event Time	6:00 PM (MDT)

Event Location	Pueblo Union Depot
Admission to this event is	Paid
IF PAID IS SELECTED Cost of Admission	$125.00
Event Description:	*Due to ongoing construction, Mariposa Center for Safety cancelled the 2nd Annual Ode to Chocolate Indulgence. The City of Pueblo generously sponsored the event in the amount of $800. We request that those funds be transferred to sponsorship of the 25th Annual Tribute to Women, Oct 10, 2026, 6-9pm at the Pueblo Union Depot. Mariposa Center for Safety (formerly the YWCA of Pueblo) proudly celebrates the 25th Annual Tribute to Women Awards Ceremony, a highly respected event honoring extraordinary women in the Pueblo community. We invite you to be part of this milestone celebration through event sponsorship, a silent auction donation, or ticket purchase. The annual Tribute to Women is our largest fundraiser of the year, with proceeds directly supporting Mariposa Center for Safety's programs and operations that serve the entire City and County of Pueblo. Your generosity helps ensure that survivors of domestic violence continue to receive the critical support and services they need. The Tribute to Women Awards recognize exceptional women who promote hope and have demonstrated outstanding dedication to the betterment of our community. Honorees are nominated in one of four categories: Young Leader (ages 16–21) Professional Achievement Community Service Triumph Over Adversity Nominations will open July 15, 2026, and award recipients will be announced at the ceremony on Saturday, October 10, 2026, at the historic Pueblo Union Depot. In 2025, Mariposa Center for Safety: Provided emergency shelter services to 533 adults and children Served 7,416 meals Provided 2,534 shelter nights Answered 654 crisis calls through our 24/7 domestic violence crisis line Thank you for your continued support. We look forward to celebrating 25 years of honoring women and strengthening our community with you at the Tribute to Women Awards Ceremony.
Does your organization hold multiple events per year?	Yes
If yes, please list the event titles and a short description.	Ode to Chocolate Indulgence - a fundraising event with attendees sampling chocolates provided by local vendors. Online Mother's Day Auction - An online fundraising auction where community members can bid on items for Mother's Day. 100 Men Campaign - an online fundraiser asking 100 men to donate $100 in support of awareness and prevention of domestic violence. Tribute to Women - an annual event recognizing women in our community who are making a difference.
Sponsorship Benefits	Name recognition in event program • Website & social media recognition • 4 tickets to the event • 4 drink tickets
Company/Organization Classification	• Non-Profit
Is your organization currently in good standing with the Secretary of State?	Yes
Have you applied for CSAC funding?	Yes

What other organizations or entities are you requesting funding from?	Black Hills Energy, San Isabel Electric, Ent Credit Union, Blue Credit Union, Bank of the San Juans, US Bank, Three Corners Connector, Pueblo PD, Common Thread, The Jackson Foundation, CHFA, and the El Pomar Foundation
What population(s) does your organization primarily serve? (multi select)	• Other
If other selected, please explain	Mariposa Center for Safety, formerly the YWCA of Pueblo, serves individuals fleeing domestic violence and court-ordered supervised child visitation. We serve all survivors, regardless of age, gender or income.
How many individuals did your organization serve last year?	770
Please upload supporting documents such as sponsorship request letter, event flyer etc.	2026 Tribute to Women Packet (2).pdf

Payment Details

Make check payable to	Mariposa Center for Safety
Address	801 N Santa Fe Ave, Pueblo, CO 81003
Phone Number	719-766-9394

Please note: If the payee listed above is not an established vendor with the City of Pueblo, the City of Pueblo vendor application (found below) must be completed before payment can be processed. If payee is an active vendor with the City of Pueblo, we will confirm the information listed above. If the information does not match our records, it must be updated using the City of Pueblo vendor application (found below) before payment can be processed. Completed vendor forms may be submitted directly to vendorinfo@pueblo.us.

Download the Vendor Application

MARIPOSA
CENTER FOR SAFETY

25th Annual Tribute to Women

Mariposa Center for Safety (formerly the YWCA of Pueblo) proudly celebrates the 25th Annual Tribute to Women Awards Ceremony, a highly respected event honoring extraordinary women in the Pueblo community. We invite you to be part of this milestone celebration through event sponsorship, a silent auction donation, or ticket purchase. The annual Tribute to Women is our largest fundraiser of the year, with proceeds directly supporting Mariposa Center for Safety's programs and operations that serve the entire City and County of Pueblo. Your generosity helps ensure that survivors of domestic violence continue to receive the critical support and services they need.

The Tribute to Women Awards recognize exceptional women who promote hope and have demonstrated outstanding dedication to the betterment of our community. Honorees are nominated in one of four categories:

- Young Leader (ages 16–21)
- Professional Achievement
- Community Service
- Triumph Over Adversity

Nominations will open July 15, 2026, and award recipients will be announced at the ceremony on Saturday, October 10, 2026, at the historic Pueblo Union Depot.

In 2025, Mariposa Center for Safety:

- Provided emergency shelter services to 533 adults and children
- Served 7,416 meals
- Provided 2,534 shelter nights
- Answered 654 crisis calls through our 24/7 domestic violence crisis line

Thank you for your continued support. We look forward to celebrating 25 years of honoring women and strengthening our community with you at the Tribute to Women Awards Ceremony.

Silent auction items must be received by October 5, 2026 and can be delivered to our offices at 801 N Santa Fe Mon-Fri 8am-4pm or contact Sandy to arrange pickup, sandym@mariposacs.org

Mariposa Center for Safety appreciates your support.
Thank you!

MARIPOSA
CENTER FOR SAFETY

25th Annual Tribute to Women

Saturday, October 10 | 6-9pm
at the Pueblo Union Depot

Mariposa Center for Safety's 25th Annual Tribute to Women, is a highly revered event honoring women in our Pueblo community. This year, in place of a seated meal, we invite attendees to socialize more informally and get to know other exceptional women of our community. Featuring hearty appetizers, cash bar, live and silent auction, photo booth, music and dancing, and lots of celebrating! We invite your organization to take part in this exciting opportunity and experience firsthand the pride we take in our cause. Your support of this annual event will give you a chance to meet other community-minded people and those who support the awareness and prevention of domestic violence.

SPONSORSHIP OPPORTUNITIES

$6,000 — Presenting Sponsor (Only 1 Available)
- Logo recognition in event program & all marketing material – "24th Annual Tribute to Women presented by YOUR COMPANY"
- Website & social media recognition
- Recognition in annual report
- 20 tickets to the event
- 40 drink tickets

$5,000 — Premier Sponsor
- Logo recognition in event program
- Website & social media recognition
- Recognition in annual report
- 16 tickets to the event
- 32 drink tickets

$2,500 — Tribute Sponsor
- Logo recognition in event program
- Website & social media recognition
- 12 tickets to the event
- 24 drink tickets

$1,250 — Honor Sponsor
- Logo recognition in event program
- Website & social media recognition
- 8 tickets to the event
- 8 drink tickets

$750 — Salute Sponsor
- Name recognition in event program
- Website & social media recognition
- 4 tickets to the event
- 4 drink tickets

MARIPOSA
CENTER FOR SAFETY

2026 Tribute to Women
Thank You for Sponsoring

Name:_____

Organization:_____

Address:_____

Email:_____ Phone:_____

☐ **Presenting $6,000**

☐ **Premier $5,000**

☐ **Tribute $2,500**

☐ **Honor $1,250**

☐ **Salute $750**

☐ **Individual $100**

☐ **Invoice me** ☐ **Payment Enclosed** ☐ **Contact me for payment**

Credit Card number:_____

Exp: ____/_____ Security Code: _____

Send your completed form to: 801 N. Santa Fe Ave., Pueblo, CO 81003 or email: sandym@mariposacs.org

Logo must be submitted no later than Sept. 15, 2026 for inclusion in program and other recognition. PNG, JPEG or Vector accepted.

For more information please contact Sandy -

719-766-9394 or sandym@mariposacs.org

MARIPOSA
CENTER FOR SAFETY

Thank you for making a contribution to our silent auction for the 25th Annual Tribute to Women

Name: _____

Organization Name: _____

Mailing Address: _____

Phone: _____

Email: _____

Description of item(s): _____

_____

_____

_____

_____

Estimated dollar value: _____

Signature & Date: _____

Silent auction items must be received by October 5, 2025 and can be delivered to our offices at 801 N Santa Fe Mon-Fri 8am-4pm or contact Sandy to arrange pickup, sandym@mariposacs.org

Mariposa Center for Safety appreciates your support.
Thank you!

OFFICE OF THE SECRETARY OF STATE
OF THE STATE OF COLORADO

CERTIFICATE OF FACT OF GOOD STANDING

I, Jena Griswold, as the Secretary of State of the State of Colorado, hereby certify that, according to the records of this office,

Mariposa Center for Safety

is a

Nonprofit Corporation

formed or registered on 05/25/1916 under the law of Colorado, has complied with all applicable requirements of this office, and is in good standing with this office. This entity has been assigned entity identification number 19871062795 .

This certificate reflects facts established or disclosed by documents delivered to this office on paper through 05/04/2026 that have been posted, and by documents delivered to this office electronically through 05/05/2026 @ 12:08:35 .

I have affixed hereto the Great Seal of the State of Colorado and duly generated, executed, and issued this official certificate at Denver, Colorado on 05/05/2026 @ 12:08:35 in accordance with applicable law. This certificate is assigned Confirmation Number 18524579 .

Jena Griswold

Secretary of State of the State of Colorado

**********End of Certificate**********

Notice: A certificate issued electronically from the Colorado Secretary of State's website is fully and immediately valid and effective. However, as an option, the issuance and validity of a certificate obtained electronically may be established by visiting the Validate a Certificate page of the Secretary of State's website, https://www.coloradosos.gov/biz/CertificateSearchCriteria.do entering the certificate's confirmation number displayed on the certificate, and following the instructions displayed. Confirming the issuance of a certificate is merely optional and is not necessary to the valid and effective issuance of a certificate. For more information, visit our website, https://www.coloradosos.gov click "Businesses, trademarks, trade names" and select "Frequently Asked Questions."

DATE	BALANCE IN 2025 CONTINGENCIES ACCOUNT		DEBIT	CREDIT	BALANCE
	Beginning Balance				$ 85,000.00
1/12/26	Catholic Charities - Espiritu Mardi Gras Masquerade		$ 1,000.00		$ 84,000.00
1/26/26	~~Mariposa Center for Safety - 2nd Annual Ode to Chocolate Indulgence~~ *Event Cancelled*		$ 800.00		$ 83,200.00
1/26/26	Latino Chamber - Dinner Dance Celebration		$ 1,000.00		$ 82,200.00
2/9/26	Boys & Girls Clubs - Champions of Youth Dinner		$ 1,500.00		$ 80,700.00
2/23/26	Pueblo Child Advocacy Center - Blue Tie Gala		$ 2,000.00		$ 78,700.00
3/9/26	NeighborWorks Southern Colorado - 6th Annual Golf Scramble		$ 500.00		$ 78,200.00
3/23/26	Care and Share Food Bank - Recipe for Hope		$ 1,000.00		$ 77,200.00
3/23/26	Garcia Foundation - The PLACE		$ 1,000.00		$ 76,200.00
4/13/26	Pueblo Latino Veterans Association - Hispanic Heritage Exhibit		$ 2,500.00		$ 73,700.00
4/13/26	Bits of Freedom - Run for the Roses, Kentucky Derby		$ 2,000.00		$ 71,700.00
4/27/26	Pueblo Conservancy District: Levee Artists - A Meet & Greet		$ 1,000.00		$ 70,700.00
4/27/26	The HARP Foundation - Rollin on The Riverwalk		$ 3,500.00		$ 67,200.00
4/27/26	CSF Fiesta Committee - Scholarship Pageant		$ 2,500.00		$ 64,700.00
4/27/26	El Movimiento Sigue - 56th Annual Cinco de Mayo		$ 2,000.00		$ 62,700.00
5/11/26	Mad Fresh - Summer Hip Hop Festival		$ 2,500.00		$ 60,200.00
5/11/26	Creative Consortium/Friendly Harbor - My Name Is		$ -		$ 60,200.00
5/11/26	Pueblo Library Foundation Booklovers Ball & Summer Reading		$ 2,000.00		$ 58,200.00
6/8/26	Mariposa Center for Safety - Tribute to Women		$ 1,700.00		$ 56,500.00
					$ 56,500.00
					$ 56,500.00
					$ 56,500.00
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Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Joe Latino, Councilor

SUBJECT: A RESOLUTION AUTHORIZING PAYMENT FROM THE COUNCIL CONTINGENCIES ACCOUNT IN THE 2026 GENERAL FUND BUDGET TO NATIONAL ASSOCIATION OF LETTER CARRIERS IN THE AMOUNT OF $1,500 TO SPONSOR THE 6TH ANNUAL NALC GOLF TOURNAMENT AT 8:00 AM AT ELMWOOD GOLF COURSE ON SUNDAY, JUNE 28, 2026

SUMMARY:

Attached for consideration is a request for support of National Association of Letter Carriers in the amount of $1,500 to sponsor the 6th Annual NALC Golf Tournament at 8:00 am at Elmwood Golf Course on Sunday, June 28, 2026.

PREVIOUS COUNCIL ACTION:

Council supported this event in 2025 for $1,000.

BACKGROUND:

City Council Member Joe Latino is requesting $1,500 to sponsor National Association of Letter Carriers 6th Annual NALC Golf Tournament. The event will take place on Sunday, June 28, 2026, at 8:00 AM at Elmwood Golf Course.

The National Association of Letter Carriers Branch 229 is a 501(c)(5) Nonprofit. In addition to being the sole representative of city letter carriers employed by the U.S. Postal Service, the National Association of Letter Carriers contributes to countless charities across the nation. Nationally, they hold the nation's largest single-day food drive and have collected more than 1.9 billion pounds of food. In 1952, the National Association of Letter Carriers became the first national sponsor of the Muscular Dystrophy Association and remains a top fundraiser for the organization.

The Golf Tournament is organized annually by Pueblo's NALC branch to fundraise for local non-profits. Golfers will compete for various prizes, participate in a silent auction and 50/50 raffle. The participation fee covers a golf cart, gift, breakfast, coffee and lunch. The committee which organizes this event every year is made up of all volunteers. This year the NALC Local 229 is raising funds to support the Pueblo Bikers United's (PBU) Annual Toy Bowl and Toy Run.

The Toy Bowl is a spirited and friendly flag football match between Pueblo Bikers United and Pueblo Law Enforcement (Pueblo PD, Sheriff's Office, and Department of Corrections) to collect toy donations for the Toy Run in December. This year the match will be held at the CSU Pueblo ThunderBowl in October.

The Pueblo Bikers United Toy Run, which is often cited as the oldest Toy Run in America, is held annually on the first Saturday of December. Every year over a thousand bikers ride together with toys strapped to their bikes, parading through the city to transport toys for local children in need. The fee to ride is typically just $1 per rider, plus a new, unwrapped toy.

FINANCIAL IMPLICATIONS:

Payment of funds in the amount of $1,500 would be paid from the Council Contingencies Account in the 2026 General Fund Budget to National Association of Letter Carriers.

BOARD/COMMISSION RECOMMENDATION:

Not applicable.

STAKEHOLDER PROCESS:

Not applicable.

ALTERNATIVES:

City Council could choose not to authorize funding for this purpose.

RECOMMENDATION:

This Resolution is at the request of Council Member Joe Latino.

ATTACHMENTS:

1. Sponsorship Request Packet - NALC - 6th Annual Golf Tournament
2. SOS - National Association of Letter Carriers Branch 229 5.21.26
3. 2026 Contingencies (Council) NALC - 6th Annual Golf Tournament

RESOLUTION NO.

A RESOLUTION AUTHORIZING PAYMENT FROM THE COUNCIL CONTINGENCIES ACCOUNT IN THE 2026 GENERAL FUND BUDGET TO NATIONAL ASSOCIATION OF LETTER CARRIERS IN THE AMOUNT OF $1,500 TO SPONSOR THE 6TH ANNUAL NALC GOLF TOURNAMENT AT 8:00 AM AT ELMWOOD GOLF COURSE ON SUNDAY, JUNE 28, 2026

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

Payment in the amount of $1,500 from the Council Contingencies Account in the 2026 General Fund Budget is authorized to be paid to National Association of Letter Carriers to sponsor the 6th Annual NALC Golf Tournament at 8:00 am at Elmwood Golf Course on Sunday, June 28, 2026.

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Resolution to effectuate the policies and procedures described herein.

SECTION 3.

This Resolution shall become effective upon passage and approval.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

Sponsorship Request

05/21/2026 10:06 AM (MDT)

Sponsorship Request

****Please submit requests at least one month in advance to allow for adequate processing time**

Please share the councilor(s) you have reached out to regarding your Sponsorship Request	Joe Latino
Requestor Name	Bernie Ortiz
Date	05/21/2026
Requestor Phone	[redacted]
Requestor Email	[redacted]
Business/Organization Name	National Association of Letter Carriers
Organization Website	nalc.org
Please share your business or organizations mission/goals	The National Association of Letter Carriers is the sole representative of city delivery letter carriers in the United States. Since it was founded in 1889, the union has defended the rights of letter carriers before abusive supervisors, unfair administrations and indifferent Congresses.
Sponsorship request for	Event
Requested Amount	$1,500
Please share the total cost to host this event last year. (If this is the first time this event has taken place, please provide the estimated total for this year.)	Approximately $5,500
Describe how contribution will be used	Funds raised will be used to support the Pueblo Bikers United Toy Bowl
Event Title	6th Annual NALC Golf Tournament
Event Date	06/28/2026
Event Time	8:00 AM (MDT)

Event Location	Elmwood Golf Course
Admission to this event is	Paid
IF PAID IS SELECTED Cost of Admission	$135 per player / $540 per team / spectator attendance is free
Event Description:	The Annual Golf Tournament is organized by the NALC to fundraise for local non-profits. Golfers will compete for various prizes, participate in a silent auction and 50/50 raffle. The participation fee covers a golf cart, gift, breakfast, coffee and lunch. The committee which organizes this event every year is made up of all volunteers. This year the NALC Local 229 is raising funds to support the The Pueblo Bikers United (PBU) Toy Run. The Toy run is a massive, historic holiday event—often cited as the longest-running and oldest of its kind in the United States. The Toy Run encompasses two events, a flag football match in October, and a Toy drive in December. The October flag football game is a spirited and friendly match between the bikers and local Pueblo Law Enforcement (including Pueblo PD, Sheriff's Office, and the Department of Corrections) at the CSU Pueblo ThunderBowl to raise toy donations. In December, over a thousand riders gather to strap toys to their bikes and parade through the city to collect gifts for local children in need. The event is held annually on the first Saturday of December, with the traditional kickstands up at 11:00 AM. Riders stage and line up at the Pueblo South High School parking lot. The fee to ride is typically just $1 per rider, plus a new, unwrapped toy. The parade generally travels down Northern Avenue, over to Highway 50, and heads up Troy Avenue to conclude near Pueblo East High School. Pueblo Bikers United's fundraisers have supported providing local underprivileged youth with toys for Christmas, and covering fees to participate in sports.
Does your organization hold multiple events per year?	No
Sponsorship Benefits	varied based on sponsorship tier
Company/Organization Classification	• Non-Profit
Is your organization currently in good standing with the Secretary of State?	Yes
Have you applied for CSAC funding?	No
What other organizations or entities are you requesting funding from?	Alpine Ford, Cactus Flower, Dan DeRose, Spradley KIA, and many other local businesses. This event is typically supported by 100+ small donations and sponsorships from local businesses. As of 5/21 we have requested sponsorships from approximately 30 businesses with approximately $6,500 either pledged or received so far.
What population(s) does your organization primarily serve?(multi select)	• Disadvantaged – low income • Youth • Adults

How many individuals did your organization serve last year?	Last year we fundraised $11,000 for the Boys & Girls Clubs of Pueblo County.

Payment Details

Make check payable to	National Association of Letter Carriers
Address	1240 LAKE AVE.PUEBLO CO 81004
Phone Number	[redacted]

Please note: If the payee listed above is not an established vendor with the City of Pueblo, the City of Pueblo vendor application (found below) must be completed before payment can be processed. If payee is an active vendor with the City of Pueblo, we will confirm the information listed above. If the information does not match our records, it must be updated using the City of Pueblo vendor application (found below) before payment can be processed. Completed vendor forms may be submitted directly to vendorinfo@pueblo.us.

Download the Vendor Application

LOCAL 229

1240 Lake Avenue, Pueblo, Colorado 81004

Subject: Corporate Sponsorship Opportunity – 6th Annual NALC Golf Tournament

Dear Sponsor,

I hope this message finds you well. On behalf of the National Association of Letter Carriers Pueblo Branch, we are excited to announce our 6th Annual Golf Tournament, which will be on Sunday, June 28, 2026, at Elmwood Golf Course at City Park, 3900 Thatcher Avenue, Pueblo, Colorado. This premier event promises a day of competitive golf, fun, and a shared commitment to supporting one of our local non-profits. Pueblo Bikers United or as most people may know them as PBU will be our recipient this year. PBU is best known for organizing one of the oldest and largest Toy Runs in the U.S. The Toy Run started in 1978 by 5 local bikers who saw a need amongst Pueblo's underprivileged children and wanted to help. In 1980 they established the Toy Bowl where the Bikers and Police compete against each other in football and over the years it has become a Pueblo tradition. Their events have supported local underprivileged children by collecting over 1,500 toys annually and they are able to assist youth with athletic fees and gear all with help from the community, sponsors, events and volunteers. We are excited this year to help this amazing organization!

As a distinguished leader in the Pueblo community, your company would make an ideal partner for this event. We are reaching out to invite your company to join us as a sponsor for NALC's 6th Annual Golf Tournament, gaining valuable exposure to "community leaders, golf enthusiasts, and potential clients".

Sponsorship Levels: We offer several opportunities to partner with us, including:

- **Diamond Sponsor**: $5000 or more- 2 golf teams, display banner, recognition at luncheon and on each table, logo on giveaway bag
- **Platinum Sponsor**: $2500- 1 golf team, Display banner, sign displayed on the green, recognition at luncheon and on each table
- **Gold Sponsor**: $1500-1 golf team, Display banner, recognition at luncheon and on each table
- **Silver Sponsor**: $500- Display banner, recognition at luncheon
- **Bronze Sponsor**: $250- Display banner, recognition at luncheon
- **Hole Sponsor:** $150- Sign displayed with your logo/ name on the green
- **Sponsor a child:** $100
- **In Kind Donation: $ _____ or Auction Item _____**
- **Please respond by May 31, 2026, and make checks payable to: NALC #229, 1240 Lake Avenue, Pueblo, CO 81004**

Your sponsorship will directly contribute to the success of the NALC's Golf Tournament and support our mission to continue to help our local community. We would be honored to partner with you for this exciting event.

Thank you for considering this opportunity, we deeply value your commitment to making a positive impact in our community.

Warm regards,

Your NALC Golf Committee Member

Bernie Ortiz

ABOUT US

NALC #229 has been hosting Annual Golf Tournaments since 2020. Its Golf Committee consists of NALC #229 current members, retired members and community volunteers.

Thanks to all of our Sponsors and Golfers last year we were able to raise approximately $16,000.00 for The Boys and Girls Club of Pueblo County.

Each year a local Pueblo non-profit is chosen to be the following year's recipient. This year's recipient is Pueblo Bikers United. PBU assists underprivileged kids with sports fees, sports gear & they are best known for their Toy Bowl & Toy Run for Christmas. Which is the largest in the U.S.

We look forward to helping PBU and Thank you for all of your years of community service!

THANK YOU TO OUR

HOLE IN ONE SPONSOR!

LogoWorX Colorado

Custom Screen Printing, Embroidery,
Promotional Products and Much More!
719-778-6574

1240 LAKE AVENUE

Pueblo, Colorado 81004

719-543-6609

Fax 719-543-0598

FOR INFORMATION OR QUESTIONS CALL

BERNIE 719-821-2151 (NALC)

DONALD 719-242-8585 (NALC)

BERLINDA 7190778-6574 (Logoworx)

Checks Payable to:
NALC #229

PLEASE JOIN US FOR A GREAT TIME!

Page 1067 of 1290

NATIONAL ASSOCIATION OF LETTER CARRIERS
U.S.A.

LOCAL 229

6TH ANNUAL GOLF TOURNAMENT

THIS YEAR'S RECIPIENT

Pueblo Bikers United
Toy Bowl & Toy Run

TOURNEY INFO:

DATE: JUNE 28, 2026

CHECK IN: 7:00 A.M.

SHOT GUN START: 8:00 A.M.

PLACE: ELMWOOD GOLF COURSE

3900 THATCHER AVENUE

PUEBLO, COLORADO

LUNCHEON, RAFFLE & SILENT AUCTION

TO FOLLOW

CONTESTS:

1ST PLACE- $500 PER TEAM

2ND PLACE- $400 PER TEAM

3RD PLACE- $300 PER TEAM

LAST PLACE- $200 PER TEAM

CLOSEST TO THE PIN ON HOLE #17

LONGEST DRIVE MEN HOLE #15

LONGEST DRIVE WOMEN HOLE #3

HOLE IN ONE ON #4- OMAHA STEAKS

HOLE IN ONE ON # 7- VISA CARD

HOLE IN ONE ON # 11- RANGE FINDER

HOLE IN ONE ON # 14- $10K SPONSERED BY LOGOWORX

WE WILL ALSO HAVE A SILENT AUCTION, 50/50 RAFFLE AND A RAFFLE FOR PRIZES!!!

SPONSOR SHIP OPPORTUNITIES

Diamond Sponsor $5000 or more: includes 2 Golf Teams, Banner, Recognition at Lunch and on Each Table, Logo on Players Gift

Platinium Sponsor $2500: includes 1 Golf Team, Banner, Sign Displayed on Green, Recognition at Lunch and on Each Table

Gold Sponsor $1500: includes 1 Golf Team, Banner, and Recognition at Lunch

Silver Sponsor $500: includes Banner and Recognition at Lunch

Bronze Sponsor $ 250: includes Sign Displayed on Green and Recognition at Lunch

Hole Sponsor $150: includes Sign with Logo/Name on the Green

Sponsor A Child $100 Donation

In Kind Donation- $_____

Auction Item- _____

Thank you in advance for your generosity!

$135 per player/ $540 per team

Registration Deadline

June 5,2026

Fee Includes Cart, Golfing, Gift, Breakfast Burrito, Donuts, Coffee and Lunch

Player 1

Name_____

Phone _____

Email _____

Player 2

Name _____

Phone _____

Email _____

Player 3

Name _____

Phone _____

Email _____

Player 4

Name _____

Phone _____

Email _____

Mulligans for Team qty._____ **$** _____

Burritos for Team- yes ____ **no** ____

Mulligans $5 each limit 2 per player

You may also register by emailing info to golfregistration@gmail.com

OFFICE OF THE SECRETARY OF STATE
OF THE STATE OF COLORADO

CERTIFICATE OF FACT OF GOOD STANDING

I, Jena Griswold, as the Secretary of State of the State of Colorado, hereby certify that, according to the records of this office,

National Association of Letter Carriers Branch 229

is a

Nonprofit Corporation

formed or registered on 03/12/2008 under the law of Colorado, has complied with all applicable requirements of this office, and is in good standing with this office. This entity has been assigned entity identification number 20081138627 .

This certificate reflects facts established or disclosed by documents delivered to this office on paper through 05/15/2026 that have been posted, and by documents delivered to this office electronically through 05/21/2026 @ 09:39:38 .

I have affixed hereto the Great Seal of the State of Colorado and duly generated, executed, and issued this official certificate at Denver, Colorado on 05/21/2026 @ 09:39:38 in accordance with applicable law. This certificate is assigned Confirmation Number 18586063 .

Secretary of State of the State of Colorado

**********End of Certificate**********

Notice: A certificate issued electronically from the Colorado Secretary of State's website is fully and immediately valid and effective. However, as an option, the issuance and validity of a certificate obtained electronically may be established by visiting the Validate a Certificate page of the Secretary of State's website, https://www.coloradosos.gov/biz/CertificateSearchCriteria.do entering the certificate's confirmation number displayed on the certificate, and following the instructions displayed. Confirming the issuance of a certificate is merely optional and is not necessary to the valid and effective issuance of a certificate. For more information, visit our website, https://www.coloradosos.gov click "Businesses, trademarks, trade names" and select "Frequently Asked Questions."

DATE	BALANCE IN 2025 CONTINGENCIES ACCOUNT		DEBIT	CREDIT	BALANCE
	Beginning Balance				$ 85,000.00
1/12/26	Catholic Charities - Espiritu Mardi Gras Masquerade		$ 1,000.00		$ 84,000.00
1/26/26	~~Mariposa Center for Safety - 2nd Annual Ode to Chocolate Indulgence~~ *Event Cancelled*		$ 800.00		$ 83,200.00
1/26/26	Latino Chamber - Dinner Dance Celebration		$ 1,000.00		$ 82,200.00
2/9/26	Boys & Girls Clubs - Champions of Youth Dinner		$ 1,500.00		$ 80,700.00
2/23/26	Pueblo Child Advocacy Center - Blue Tie Gala		$ 2,000.00		$ 78,700.00
3/9/26	NeighborWorks Southern Colorado - 6th Annual Golf Scramble		$ 500.00		$ 78,200.00
3/23/26	Care and Share Food Bank - Recipe for Hope		$ 1,000.00		$ 77,200.00
3/23/26	Garcia Foundation - The PLACE		$ 1,000.00		$ 76,200.00
4/13/26	Pueblo Latino Veterans Association - Hispanic Heritage Exhibit		$ 2,500.00		$ 73,700.00
4/13/26	Bits of Freedom - Run for the Roses, Kentucky Derby		$ 2,000.00		$ 71,700.00
4/27/26	Pueblo Conservancy District: Levee Artists - A Meet & Greet		$ 1,000.00		$ 70,700.00
4/27/26	The HARP Foundation - Rollin on The Riverwalk		$ 3,500.00		$ 67,200.00
4/27/26	CSF Fiesta Committee - Scholarship Pageant		$ 2,500.00		$ 64,700.00
4/27/26	El Movimiento Sigue - 56th Annual Cinco de Mayo		$ 2,000.00		$ 62,700.00
5/11/26	Mad Fresh - Summer Hip Hop Festival		$ 2,500.00		$ 60,200.00
5/11/26	Creative Consortium/Friendly Harbor - My Name Is		$ -		$ 60,200.00
5/11/26	Pueblo Library Foundation Booklovers Ball & Summer Reading		$ 2,000.00		$ 58,200.00
6/8/26	Mariposa Center for Safety - Tribute to Women		$ 1,700.00		$ 56,500.00
6/8/26	NALC - 6th Annual Golf Tournament		$ 1,500.00		$ 55,000.00
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Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Dianne Danti, Councilor

SUBJECT: A RESOLUTION AUTHORIZING PAYMENT FROM THE COUNCIL CONTINGENCIES ACCOUNT IN THE 2026 GENERAL FUND BUDGET TO PUEBLO SYMPHONY ASSOCIATION IN THE AMOUNT OF $2,500 TO SPONSOR THE 2026 PUEBLO'S FABULOUS 4TH OUTDOOR CONCERT AT 7:00 PM AT COLORADO STATE UNIVERSITY PUEBLO ON SATURDAY, JULY 4, 2026

SUMMARY:

Attached for consideration is a request for support of Pueblo Symphony Association in the amount of $2,500 to sponsor the 2026 Pueblo's Fabulous 4th Outdoor Concert at 7:00 PM at Colorado State University Pueblo on Saturday, July 4, 2026.

PREVIOUS COUNCIL ACTION:

Council supported the Pueblo Symphony's 4th of July Concert for $4,650 in 2018 and for $5,000 in 2019, with both sponsorships paid to Memorial Hall for use of their facilities. Council also supported the 2022 Pueblo Symphony Orchestra season for $294.34.

BACKGROUND:

City Council Member Dianne Danti is requesting $2,500 to sponsor the Pueblo Symphony Association's 2026 Pueblo's Fabulous 4th Outdoor Concert. The concert will take place on Saturday, July 4, 2026, at 7:00 PM at Colorado State University Pueblo.

The Pueblo Symphony Association is a 501(c)(3) whose purpose is to provide a quality musical experiences for the people of Pueblo by recognizing that music is a vital feature of the artistic, cultural, and educational life of a community.

Since 1994, The Pueblo Symphony Orchestra has proudly provided a free July 4th community concert. They hope to orchestrate access to arts while strengthening community pride and strive to foster human connection through live events, and make

the world a more musical place. Guest Artists for the multi-generational concert are chosen to foster connection and inclusion through shared musical experiences.

Pueblo's Fabulous 4th Outdoor Concert is presented by the Pueblo Symphony as part of a collaboration with Colorado State University Pueblo. The university presents a day long family celebration that culminates in an evening concert by the symphony followed by a drone show and fireworks display.

Sponsorship funds will be used to support event costs such as guest artists, orchestra players, sound, lighting, and the jumbo viewing screen. This sponsorship tier includes 4 tickets in the reserved seating section.

FINANCIAL IMPLICATIONS:

Payment of funds in the amount of $2,500 would be paid from the Council Contingencies Account in the 2026 General Fund Budget to Pueblo Symphony Association.

BOARD/COMMISSION RECOMMENDATION:

Not applicable.

STAKEHOLDER PROCESS:

Not applicable.

ALTERNATIVES:

City Council could choose not to authorize funding for this purpose.

RECOMMENDATION:

This Resolution is at the request of Council Member Dianne Danti.

ATTACHMENTS:

1. Sponsorship Request Packet - Pueblo Symphony Association - Pueblo's Fabulous 4th Outdoor Concert
2. SOS - Pueblo Symphony Association 5.26.26
3. 2026 Contingencies (Council) Pueblo Symphony Association - Pueblo's Fabulous 4th Outdoor Concert

RESOLUTION NO.

A RESOLUTION AUTHORIZING PAYMENT FROM THE COUNCIL CONTINGENCIES ACCOUNT IN THE 2026 GENERAL FUND BUDGET TO PUEBLO SYMPHONY ASSOCIATION IN THE AMOUNT OF $2,500 TO SPONSOR THE 2026 PUEBLO'S FABULOUS 4TH OUTDOOR CONCERT AT 7:00 PM AT COLORADO STATE UNIVERSITY PUEBLO ON SATURDAY, JULY 4, 2026

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

Payment in the amount of $2,500 from the Council Contingencies Account in the 2026 General Fund Budget is authorized to be paid to Pueblo Symphony Association to sponsor the 2026 Pueblo's Fabulous 4th Outdoor Concert at 7:00 PM at Colorado State University Pueblo on Saturday, July 4, 2026.

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Resolution to effectuate the policies and procedures described herein.

SECTION 3.

This Resolution shall become effective upon passage and approval.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

Sponsorship Request

05/22/2026 7:44 PM (MDT)

Sponsorship Request

****Please submit requests at least one month in advance to allow for adequate processing time**

Please share the councilor(s) you have reached out to regarding your Sponsorship Request	Dianne Danti
Requestor Name	June King
Date	05/22/2026
Requestor Phone	[redacted]
Requestor Email	[redacted]
Business/Organization Name	Pueblo Symphony Association
Organization Website	pueblosymphony.com
Please share your business or organizations mission/goals	Our Goal: Since 1994, The Pueblo Symphony Orchestra has proudly provided a FREE July 4th community concert. We hope to orchestrate access to arts while strengthening community pride. Guest Artists for the multi-generational concert are chosen to foster connection and inclusion through shared musical experiences. In a world of artificial intelligence and digital experiences, we are committed more than ever to human connection through live events. We strive to make the world a more musical place.
Sponsorship request for	Event
Requested Amount	$2,500
Please share the total cost to host this event last year. (If this is the first time this event has taken place, please provide the estimated total for this year.)	$60,000 Cost to Host Concert for 2025
Describe how contribution will be used	Funds will be used to support the concert. While the concert is free to the public, the "true cost" to the Pueblo Symphony is $50k which covers guest artists, orchestra players, sound, lighting, and jumbo viewing screen.
Event Title	Pueblo's Fabulous 4th Outdoor Concert

Event Date	07/04/2026
Event Time	7:00 PM (MDT)
Event Location	Colorado State University Pueblo Campus
Admission to this event is	Free
Event Description:	Pueblo's Fabulous 4th Outdoor Concert is presented by the Pueblo Symphony as part of a collaboration with Colorado State University Pueblo. The university presents a day long family celebration that culminates in an evening concert by the symphony followed by a drone show and fireworks display.
Does your organization hold multiple events per year?	No
Sponsorship Benefits	4 Seats in the Reserved Seating Section
Company/Organization Classification	• Non-Profit
Is your organization currently in good standing with the Secretary of State?	Yes
Have you applied for CSAC funding?	No
What other organizations or entities are you requesting funding from?	Pueblo County & Miscellaneous Businesses in the Community
What population(s) does your organization primarily serve?(multi select)	• Disadvantaged – low income • Youth • Adults • Families • Senior Citizens • LGBTQ+ • Persons with disabilities • Veterans
How many individuals did your organization serve last year?	5000
Please upload supporting documents such as sponsorship request letter, event flyer etc.	July 4th Entertainment Sponsorship.pdf Sponsor Letter.JK Signed.pdf

Payment Details

Make check payable to	Pueblo Symphony Association
Address	301 N Main Street, Suite 106 Pueblo CO 81003

Phone Number	719-545-7967

Please note: If the payee listed above is not an established vendor with the City of Pueblo, the City of Pueblo vendor application (found below) must be completed before payment can be processed. If payee is an active vendor with the City of Pueblo, we will confirm the information listed above. If the information does not match our records, it must be updated using the City of Pueblo vendor application (found below) before payment can be processed. Completed vendor forms may be submitted directly to vendorinfo@pueblo.us.

Download the **Vendor Application**

PUEBLO'S FABULOUS 4th SYMPHONY OUTDOOR CONCERT

April 2026

Subject: ***Partnering in a 30-Year Legacy of Community Impact***

Dear Community Investor,

At the *Pueblo Symphony*, we believe that a thriving city is defined by the strength of its cultural heartbeat. We are reaching out to you because of your longstanding commitment to the betterment of the Pueblo community. We invite you to join us as a partner for our upcoming outdoor concert to celebrate America's 250th & Colorado's 150th birthdays.

Since 1994, we have proudly provided a free July 4th community concert, a tradition that has stood for over three decades as a cornerstone of our city's identity. The evening concert culminates with fireworks and a drone show as part of a collaboration with Colorado State University Pueblo's *Let Freedom Howl* event. While the concert is free to the public, the "true cost" to the Pueblo Symphony is $50k which covers guest artist, players, sound, lighting, & jumbo screen.

Each year the guest artist for this multi-generational concert is thoughtfully chosen to foster connection and inclusion through shared musical experiences. This year's guest artists will be *Beach Boys Tribute Performers* who will blend nostalgia with new, high-energy performances that appeal to ages ranging from children to seniors. By supporting **Pueblo's Fabulous 4th Free Outdoor Concert** by the *Pueblo Symphony*, you are investing in:

- *Social Fabric*: Providing essential shared experiences that strengthen local pride and combat social isolation.
- *Inclusion & Access*: Ensuring that world-class music remains a "community of choice, not income" by removing financial barriers to concert entertainment.
- *Mental Well-being*: Providing a sanctuary for relaxation that enhances emotional health and fosters a shared sense of belonging.

In a world of artificial intelligence and digital experiences, we are committed more than ever to human connection through live events. We invite you to join us in making the world a more musical place.

Warmly,

June H King
Executive Director

Pueblo Symphony Association, Non-Profit Tax ID 84-0580443

PS!
pueblosymphony.com



Our Community Concert Vision

Since 1994, the ***Pueblo Symphony Orchestra*** has proudly provided a **FREE** July 4th community concert. We hope to orchestrate access to the arts while strengthening community pride. Each year the guest artist for this multi-generational concert is thoughtfully chosen to foster connection and inclusion through shared musical experiences. In a world of artificial intelligence and digital experiences, we are committed more than ever to human connection through live events. We strive to make the world a more musical place.

PUEBLO'S FABULOUS 4th

PUEBLO SYMPHONY OUTDOOR CONCERT

Sponsorships

Partnering in a 30 year legacy of community impact

♥ Presenting Patron
@ $7,000 and above

Includes: **twelve (12) seats**, stage announcement and jumbo screen presence, top-tier logo on the Symphony website, social media presence, and a select print presence.

♥ Red Patron
@ $4,000 to $6,999

Includes: **eight (8) seats**, jumbo screen presence, logo on the Symphony website, social media presence, and a select print presence.

♥ White Patron
@ $2,500 to $3,999

Includes: **four (4) seats**, jumbo screen presence, logo on the Symphony website, social media presence, and a select print presence.

♥ Blue Patron
@ $1,000 to $2,499

Includes: jumbo screen presence, logo on the Symphony website, social media presence, and a select print presence.

Sponsorship Levels

☐ **PRESENTING** @ $7,000 & above
actual amount $ _____

♥

☐ **RED** @ $4,000 to $6,999
actual amount $ _____

♥

☐ **WHITE** @ $2,500 to $3,999
actual amount $ _____

♥

☐ **BLUE** @ $1,000 to $2,499
actual amount $ _____

Please recognize my sponsorship as:

_____

REQUIRED BELOW *

Name/Business* _____

Address* _____

_____

City* _____ State* _____ Zip* _____

Phone* _____

Email* _____

Payment Options

☐ **BY CHECK** make payable to the *Pueblo Symphony* and return it with this form.

☐ **BY CREDIT CARD**: you will receive an email with a link to process your payment.

THANK YOU!



June King, *Executive Director*
pueblosymphony@gmail.com
cell 719.**252.4319**
office 719.**545.7967**
301 North Main, Suite 106
Pueblo, Colorado 81003

OFFICE OF THE SECRETARY OF STATE
OF THE STATE OF COLORADO

CERTIFICATE OF FACT OF GOOD STANDING

I, Jena Griswold, as the Secretary of State of the State of Colorado, hereby certify that, according to the records of this office,

PUEBLO SYMPHONY ASSOCIATION, INC.

is a

Nonprofit Corporation

formed or registered on 08/14/1941 under the law of Colorado, has complied with all applicable requirements of this office, and is in good standing with this office. This entity has been assigned entity identification number 19871106430 .

This certificate reflects facts established or disclosed by documents delivered to this office on paper through 05/21/2026 that have been posted, and by documents delivered to this office electronically through 05/26/2026 @ 09:02:54 .

I have affixed hereto the Great Seal of the State of Colorado and duly generated, executed, and issued this official certificate at Denver, Colorado on 05/26/2026 @ 09:02:54 in accordance with applicable law. This certificate is assigned Confirmation Number 18601448 .

Jena Griswold

Secretary of State of the State of Colorado

**********End of Certificate**********

Notice: A certificate issued electronically from the Colorado Secretary of State's website is fully and immediately valid and effective. However, as an option, the issuance and validity of a certificate obtained electronically may be established by visiting the Validate a Certificate page of the Secretary of State's website, https://www.coloradosos.gov/biz/CertificateSearchCriteria.do entering the certificate's confirmation number displayed on the certificate, and following the instructions displayed. Confirming the issuance of a certificate is merely optional and is not necessary to the valid and effective issuance of a certificate. For more information, visit our website, https://www.coloradosos.gov click "Businesses, trademarks, trade names" and select "Frequently Asked Questions."

DATE	BALANCE IN 2025 CONTINGENCIES ACCOUNT		DEBIT	CREDIT	BALANCE
	Beginning Balance				$ 85,000.00
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1/26/26	~~Mariposa Center for Safety - 2nd Annual Ode to Chocolate Indulgence~~ *Event Cancelled*		$ 800.00		$ 83,200.00
1/26/26	Latino Chamber - Dinner Dance Celebration		$ 1,000.00		$ 82,200.00
2/9/26	Boys & Girls Clubs - Champions of Youth Dinner		$ 1,500.00		$ 80,700.00
2/23/26	Pueblo Child Advocacy Center - Blue Tie Gala		$ 2,000.00		$ 78,700.00
3/9/26	NeighborWorks Southern Colorado - 6th Annual Golf Scramble		$ 500.00		$ 78,200.00
3/23/26	Care and Share Food Bank - Recipe for Hope		$ 1,000.00		$ 77,200.00
3/23/26	Garcia Foundation - The PLACE		$ 1,000.00		$ 76,200.00
4/13/26	Pueblo Latino Veterans Association - Hispanic Heritage Exhibit		$ 2,500.00		$ 73,700.00
4/13/26	Bits of Freedom - Run for the Roses, Kentucky Derby		$ 2,000.00		$ 71,700.00
4/27/26	Pueblo Conservancy District: Levee Artists - A Meet & Greet		$ 1,000.00		$ 70,700.00
4/27/26	The HARP Foundation - Rollin on The Riverwalk		$ 3,500.00		$ 67,200.00
4/27/26	CSF Fiesta Committee - Scholarship Pageant		$ 2,500.00		$ 64,700.00
4/27/26	El Movimiento Sigue - 56th Annual Cinco de Mayo		$ 2,000.00		$ 62,700.00
5/11/26	Mad Fresh - Summer Hip Hop Festival		$ 2,500.00		$ 60,200.00
5/11/26	Creative Consortium/Friendly Harbor - My Name Is		$ 3,000.00		$ 57,200.00
5/11/26	Pueblo Library Foundation Booklovers Ball & Summer Reading		$ 2,000.00		$ 55,200.00
6/8/26	Mariposa Center for Safety - Tribute to Women		$ 1,700.00		$ 53,500.00
6/8/26	NALC - 6th Annual Golf Tournament		$ 1,500.00		$ 52,000.00
6/8/26	Pueblo Symphony Assoc. - Pueblo's Fabulous 4th Outdoor		$ 2,500.00		$ 49,500.00
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Background Paper for Proposed Resolution

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Joe Latino, Councilor
Mark Aliff, President

SUBJECT: A RESOLUTION AUTHORIZING PAYMENT FROM THE COUNCIL CONTINGENCIES ACCOUNT IN THE 2026 GENERAL FUND BUDGET TO PUEBLO ZOOLOGICAL SOCIETY (DBA PUEBLO ZOO) IN THE AMOUNT OF $1,800 TO SPONSOR ZOOFARI AT 4:30 PM AT THE PUEBLO ZOO ON SATURDAY, JUNE 20TH, 2026

SUMMARY:

Attached for consideration is a request for support of Pueblo Zoological Society (DBA Pueblo Zoo) in the amount of $1,800 to sponsor Zoofari at 4:30 PM at the Pueblo Zoo on Saturday, June 20th, 2026.

PREVIOUS COUNCIL ACTION:

Council sponsored this event in 2024 for $1,500 and in 2025 for $2,000. In previous years, City Council purchased individual tickets rather than sponsoring a table.

BACKGROUND:

City Council Member Joe Latino is requesting $1,800 to sponsor the Pueblo Zoo's fundraiser Zoofari. The event will take place on Saturday, June 20th, 2026, at 4:30 PM at the Pueblo Zoo.

The Pueblo Zoo is a 501(c)(3) whose mission is to empower people to engage in the conservation of animals and their natural habitats.

Zoofari is the Pueblo Zoo's biggest and most important annual fundraiser. The event is an exclusive evening filled with behind-the-scenes animal experiences, special tours of their grounds, tasty cuisine, and their highly anticipated silent and live auctions featuring one-of-a-kind packages that you cannot find anywhere else in town. The energy, atmosphere, and community is unmatched. Based on guest feedback, they have moved the event to Saturday to make sure folks can arrive early enough to take

full advantage of all the event has to offer.

Zoofari draws a vibrant crowd of business leaders, civic partners, and dedicated supporters, making Zoofari not only a celebration, but an opportunity to connect with other dedicated community members.

All proceeds from the event are put towards Zoo operations, helping them continue to provide exceptional care for more than 300 animals, bring engaging educational programs to nearly every elementary school in our community, and create meaningful experiences for the more than 90,000 guests who walk through their gates each year. Zoofari is the driving force behind their annual impact and fuels everything they are able to do.

This sponsorship tier includes 8 tickets to the event.

FINANCIAL IMPLICATIONS:

Payment of funds in the amount of $1,800 would be paid from the Council Contingencies Account in the 2026 General Fund Budget to Pueblo Zoological Society (DBA Pueblo Zoo).

BOARD/COMMISSION RECOMMENDATION:

Not applicable.

STAKEHOLDER PROCESS:

Not applicable.

ALTERNATIVES:

City Council could choose not to authorize funding for this purpose.

RECOMMENDATION:

This Resolution is at the request of Council Member Joe Latino.

ATTACHMENTS:

1. Sponsorship Request Packet - Pueblo Zoo - Zoofari
2. SOS - Pueblo Zoological Society 5.27.26
3. 2026 Contingencies (Council) Pueblo Zoo - Zoofari

RESOLUTION NO.

A RESOLUTION AUTHORIZING PAYMENT FROM THE COUNCIL CONTINGENCIES ACCOUNT IN THE 2026 GENERAL FUND BUDGET TO PUEBLO ZOOLOGICAL SOCIETY (DBA PUEBLO ZOO) IN THE AMOUNT OF $1,800 TO SPONSOR ZOOFARI AT 4:30 PM AT THE PUEBLO ZOO ON SATURDAY, JUNE 20TH, 2026

BE IT RESOLVED BY THE CITY COUNCIL OF PUEBLO, that

SECTION 1.

Payment in the amount of $1,800 from the Council Contingencies Account in the 2026 General Fund Budget is authorized to be paid to Pueblo Zoological Society (DBA Pueblo Zoo) to sponsor Zoofari at 4:30 PM at the Pueblo Zoo on Saturday, June 20th, 2026.

SECTION 2.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Resolution to effectuate the policies and procedures described herein.

SECTION 3.

This Resolution shall become effective upon passage and approval.

INTRODUCED: June 8, 2026

BY: None
MEMBER OF CITY COUNCIL

APPROVED: _____
PRESIDENT OF CITY COUNCIL

ATTESTED BY: _____
CITY CLERK

Sponsorship Request

05/26/2026 3:24 PM (MDT)

Sponsorship Request

****Please submit requests at least one month in advance to allow for adequate processing time**

Please share the councilor(s) you have reached out to regarding your Sponsorship Request	Mark Aliff
Requestor Name	Abigail Krause
Date	05/26/2026
Requestor Phone	[redacted]
Requestor Email	[redacted]
Business/Organization Name	Pueblo Zoo
Organization Website	www.pueblozoo.org
Please share your business or organizations mission/goals	To empower people to engage in conservation of animals and their natural habitat.
Sponsorship request for	Event
Requested Amount	1800
Please share the total cost to host this event last year. (If this is the first time this event has taken place, please provide the estimated total for this year.)	$29,799
Describe how contribution will be used	All proceeds from Zoofari go to zoo operations
Event Title	Zoofari
Event Date	06/20/2026
Event Time	4:30 PM (MDT)
Event Location	Pueblo Zoo 3455 Nuckolls Ave

Admission to this event is	Paid
IF PAID IS SELECTED Cost of Admission	$150 - individual tickets
Event Description:	Zoofari is our most important annual fundraiser. It is an exclusive evening filled with behind-the-scenes animal experiences, special tours of our grounds, tasty cuisine, and our highly anticipated silent and live auctions featuring one-of-a-kind packages that you cannot find anywhere else in town. The energy, atmosphere, and community is unmatched. In fact, based on guest feedback, we have moved the event to Saturday to make sure folks can arrive early enough to take full advantage of all the event has to offer. Zoofari draws a vibrant crowd of business leaders, civic partners, and dedicated supporters, making Zoofari not only a celebration, but an opportunity to connect with other dedicated community members. Your sponsorship makes a real difference. With your support, we can continue to provide exceptional care for more than 300 animals, bring engaging educational programs to nearly every elementary school in our community, and create meaningful experiences for the more than 90,000 guests who walk through our gates each year. Zoofari is the driving force behind our annual impact and fuels everything that we are able to do.
Does your organization hold multiple events per year?	Yes
If yes, please list the event titles and a short description.	Brew at the Zoo Senior Safari Zoo Boo Electricritters
Sponsorship Benefits	Event Tickets, program and event recognition, recognition in ZooNews and on website
Company/Organization Classification	• Non-Profit
Is your organization currently in good standing with the Secretary of State?	Yes
Have you applied for CSAC funding?	Yes
What other organizations or entities are you requesting funding from?	Businesses and individuals - Southwest Motors - Paddle Sponsor The Jackson Foundation Dairy Queen PB&T Bank NorthStar Engineering and Surveying Vidmar Motor Co. Security Service Federal Credit Union Pueblo Electrics Inc. Pueblo Municipal Shooters Club Fieldman Financial Ryals Foundation Brian Corsi - Allstate Insurance Rickman Pack Houston Construction Steel City Pediatrics

	Look By Brooke Minnequa Works Credit Union PepsiCo SunWest Credit Union El Pomar Pueblo Water Altman, Keilbach, Lytle, Parlapiano & Ware, P.C. IBEW Local #12 Bill Crain Angelus Chapel Mortuaries St Mary Corwin CSU Pueblo Bank of the San Juans Mark Gregory State Farm Insurance Robert and Pat Gardner Flow Right Plumbing, Heating, Cooling and Electrical Ferguson Family TR Toppers Ferguson Family
What population(s) does your organization primarily serve?(multi select)	• Youth • Disadvantaged – low income • Adults • Families • Senior Citizens • LGBTQ+ • Persons with disabilities • Veterans
How many individuals did your organization serve last year?	90,000
Please upload supporting documents such as sponsorship request letter, event flyer etc.	Zoofari_2026_Benefits Updated.pdf 2026 SPONSOR General Request w letterhead.pdf

Payment Details

Make check payable to	Pueblo Zoo
Address	3455 Nuckolls Ave Pueblo, CO 81005
Phone Number	719-561-1452

Please note: If the payee listed above is not an established vendor with the City of Pueblo, the City of Pueblo vendor application (found below) must be completed before payment can be processed. If payee is an active vendor with the City of Pueblo, we will confirm the information listed above. If the information does not match our records, it must be updated using the City of Pueblo vendor application (found below) before payment can be processed. Completed vendor forms may be submitted directly to vendorinfo@pueblo.us.

Download the Vendor Application

Pueblo ZOO
Empower. Engage. Conserve.

pueblozoo.org
719-561-1452
3455 Nuckolls Ave
Pueblo, CO, 81005

Dear Friend of the Zoo,

Zoofari is back for another year of "wild" fun on **Saturday, June 20, 2026.** Zoofari, the zoo's most important fundraiser of the year, has grown into Pueblo's most unique "garden party" experience as guests mingle and visit the zoo in this outdoor atmosphere. This is not your typical fundraiser, it is an exclusive evening filled with behind-the-scenes animal experiences, special tours of our grounds, tasty cuisine, and our highly anticipated silent and live auctions featuring one-of-a-kind packages that you cannot find anywhere else in town. The energy, atmosphere, and community are unmatched. In fact, based on guest feedback, we have moved the event to Saturday to make sure folks can arrive early enough to take full advantage of all the event has to offer.

As a sponsor, you will receive guest tickets to experience the evening for yourself. Zoofari draws a vibrant crowd of business leaders, civic partners, and dedicated supporters, making Zoofari not only a celebration, but an opportunity to connect with other dedicated community members.

Your sponsorship makes a real difference. With your support, we can continue to provide exceptional care for more than 300 animals, bring engaging educational programs to nearly every elementary school in our community, and create meaningful experiences for the more than 90,000 guests who walk through our gates each year. Zoofari is the driving force behind our annual impact and fuels everything that we are able to do.

In addition to Zoofari, we offer year-round sponsorship opportunities for both our events and animal exhibits. We are always excited to help in expanding your impact and exploring options that fit your vision, marketing, and community engagement goals.

We hope you will join us. Together, we can make this year's Zoofari the most successful yet! If you have questions or need more information, please call (719) 561-1452 ext. 127 or email cowan@pueblozoo.org. If you are ready to reserve your spot, please complete and return the enclosed form.

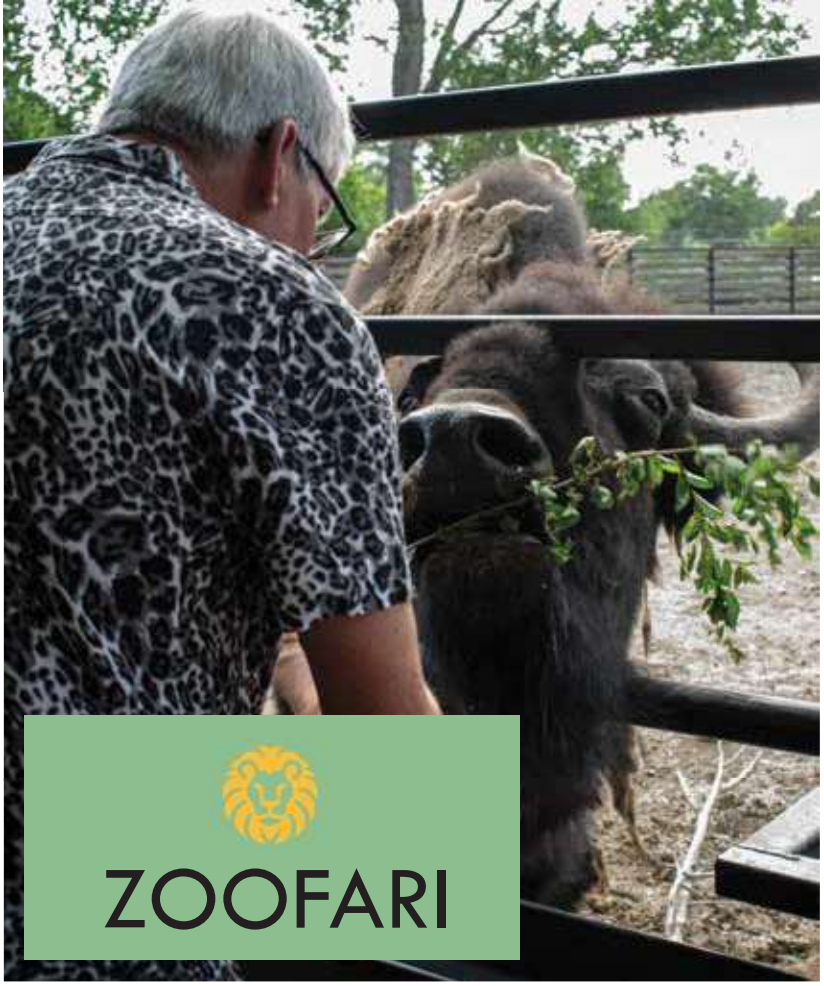
Thank you for being such an important part of the Pueblo Zoo family. We cannot wait to celebrate with you!

Sincerely,

Abigail J. Krause

Abigail Krause, Executive Director

The Pueblo Zoo is a registered 501(c)3 non-profit organization (Tax ID 84-0723360). All contributions are tax-deductible less value of tickets received.









ZOOFARI

June 20, 2026

Join community leaders, influencers and philanthropists at the zoo's signature event. With a distinct flavor and vibe, this outdoor event is in mid-June and features behind the scenes tours, live music, a variety of food choices, open bar, and robust live and silent auctions.

Sponsor Benefits	Premier $3,600	Leadership $1,800	Supporter $900	Friend $450
Zoofari Program Recognition	✓	✓	✓	✓
Recognition on Signage at The Event	✓	✓		
Recognition in ZooNews Mailed to 2,600 Households	✓	✓		
Recognition in Monthly eNews (12,000 subscribers)	✓	✓	✓	✓
Recognition on Zoo Website	✓	✓	✓	
Zoofari Tickets	16	8	4	2
Complimentary Day Passes to the Pueblo Zoo	16	8	4	2

Yes!

I would like to be a sponsor for

ZOOFARI

Name: _____

Company: _____

Address: _____

City:_____ **State:** _____ **Zip:** _____

Phone: _____ **Email:** _____

Choose your level:

Premier Sponsor $3,600	☐	Leadership $1,800	☐	Supporter $900	☐	Friend $450	☐

☐ **I would like to send a check**

☐ **Please send me an invoice**

☐ **Please charge my Credit Card**

Card #: _____ **Expiration:** _____ **CVV #:** _____

Signature: _____

All sponsorships are considered a donation and are tax dedicutible, less the value of any physical benefits received (i.e. passes, etc.) Passes may be refused to get full tax benefit.

Please return to:

Audrey Cowan
acowan@pueblozoo.org
Pueblo Zoo, 3455 Nuckolls Ave
Pueblo CO 81005
719-561-1452 ext 127

Pueblo ZOO

Empower. Engage. Conserve.

OFFICE OF THE SECRETARY OF STATE
OF THE STATE OF COLORADO

CERTIFICATE OF FACT OF GOOD STANDING

I, Jena Griswold, as the Secretary of State of the State of Colorado, hereby certify that, according to the records of this office,

PUEBLO ZOOLOGICAL SOCIETY

is a

Nonprofit Corporation

formed or registered on 11/10/1976 under the law of Colorado, has complied with all applicable requirements of this office, and is in good standing with this office. This entity has been assigned entity identification number 19871313038 .

This certificate reflects facts established or disclosed by documents delivered to this office on paper through 05/26/2026 that have been posted, and by documents delivered to this office electronically through 05/27/2026 @ 09:52:08 .

I have affixed hereto the Great Seal of the State of Colorado and duly generated, executed, and issued this official certificate at Denver, Colorado on 05/27/2026 @ 09:52:08 in accordance with applicable law. This certificate is assigned Confirmation Number 18607264 .

Secretary of State of the State of Colorado

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Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Andrew Hayes, Public Works Director

SUBJECT: AN ORDINANCE APPROVING THE 3RD AMENDMENT TO THE INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION ("CITY"), AND THE STATE OF COLORADO, ACTING BY AND THROUGH THE COLORADO DEPARTMENT OF TRANSPORTATION ("CDOT"), PROJECT TAP M086-091 (24079)/MTF M086-088 (24024) FOR THE PRAIRIE AVENUE TO MINNEQUA LAKE TRAIL PROJECT, DECREASING THE FUNDING FROM $1,410,542.00 TO $1,354,010.04 AND AUTHORIZING THE MAYOR TO EXECUTE SAME

SUMMARY:

This Ordinance approves the 3rd Amendment of an Intergovernmental Agreement ("IGA") between the City of Pueblo, a Colorado Municipal Corporation ("City") and the State of Colorado, Colorado Department of Transportation ("CDOT") relating to the Prairie Avenue to Minnequa Lake Trail Project by reducing the funding from $1,410,542.00 to $1,354,010.04.

PREVIOUS COUNCIL ACTION:

Ordinance 9969, final adoption by City Council on July 26, 2021, established project CI2115, approved the Intergovernmental Agreement (IGA) between the City of Pueblo and the Colorado Department of Transportation (CDOT), budgeted and appropriated funds totaling $388,000.00 for the Prairie Avenue to Minnequa Lake Trail Project.

Resolution 14816, final approval by City Council on February 28, 2022, awarded an Agreement for Professional Design Services to Dibble & Associates Consulting Engineers, Inc., for engineering design services for Prairie Avenue to Minnequa Lake Trail Project.

Ordinance 10307, final approval by City Council on October 24, 2022, approved the 1st Amendment to the Intergovernmental Agreement (IGA) between the City of Pueblo and

the Colorado Department of Transportation (CDOT), budgeted and appropriated funds totaling $1,022,542.00 for the Prairie Avenue to Minnequa Lake Trail Project.

Resolution 15219, dated May 8, 2023, awarded a construction contract in the amount of $882,538.00 to Standard Concrete, Inc., for Project 23-025, Prairie Avenue to Minnequa Lake Trail, setting forth $429,004.00 for contingencies.

Ordinance 10615, final approval by City Council on December 11, 2023, approved the 2nd Amendment to the Intergovernmental Agreement (IGA) between the City of Pueblo and the Colorado Department of Transportation (CDOT), to remove CDOT insurance requirements.

BACKGROUND:

The project includes the design and construction of an on-street and off-street trail connection from Prairie Avenue and SH45, Pueblo Boulevard, to Lake Minnequa in the City, Project M086-088 (24024) and M086-091 (24079). The project will include the design of the entire project and will include construction of a ten-foot-wide concrete multi-use trail, trailhead improvements and trail grade improvements. The project will also include lighting, crosswalk improvements, onstreet bike lanes, bollards and some grading.

The project, according to the Scope of Work contained in the IGA and all amendments, has been completed. The amendment formalizes the return of the unused grant funds to the Transportation Alternatives Program and the Multimodal Option Funds Program.

FINANCIAL IMPLICATIONS:

None.

BOARD/COMMISSION RECOMMENDATION:

None.

STAKEHOLDER PROCESS:

None.

ALTERNATIVES:

Denial of this Ordinance would deny returning the funds back to the State of Colorado.

RECOMMENDATION:

Approve the Ordinance.

ATTACHMENTS:

1. Draft AM3 Pueblo (24079 24024) 331002373 May 01, 2026
2. GRANT CERTIFICATION (signed)

ORDINANCE NO.

AN ORDINANCE APPROVING THE 3RD AMENDMENT TO THE INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION ("CITY"), AND THE STATE OF COLORADO, ACTING BY AND THROUGH THE COLORADO DEPARTMENT OF TRANSPORTATION ("CDOT"), PROJECT TAP M086-091 (24079)/MTF M086-088 (24024) FOR THE PRAIRIE AVENUE TO MINNEQUA LAKE TRAIL PROJECT, DECREASING THE FUNDING FROM $1,410,542.00 TO $1,354,010.04 AND AUTHORIZING THE MAYOR TO EXECUTE SAME

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The 3rd Amendment to the Intergovernmental Agreement (“Amendment”) between the City of Pueblo, a Colorado Municipal Corporation, and State of Colorado, acting by and through the Colorado Department of Transportation (CDOT), Project: TAP M086-091 (24079)/MTF M086-088 (24024), Prairie Avenue to Minnequa Lake Trail Project, a copy of which is attached, having been approved as to form by the City Attorney, is hereby approved.

SECTION 2.

The Mayor is authorized to execute and deliver the Amendment in the name of the City of Pueblo and the City Clerk is directed to affix the seal of the City thereto and attest same.

SECTION 3.

The officers of the City are authorized to perform any and all acts consistent with this Ordinance to implement the policies and procedures described herein.

SECTION 4.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

STATE OF COLORADO AMENDMENT

Amendment #: 3 **Project: TAP M086-091 (24079)/ MTF M086-088 (24024)**

SIGNATURE AND COVER PAGE

State Agency Department of Transportation	**Amendment Routing Number** 21-HA2-XC-00024-M0005
Local Agency City of Pueblo	**Original Agreement Routing Number** 21-HA2-XC-00024
Agreement Maximum Amount $1,354,010.04	**Agreement Beginning Date** May 10, 2021
	Agreement Expiration Date The earlier of the Amendment Effective Date or February 24, 2031

THE PARTIES HERETO HAVE EXECUTED THIS AMENDMENT

Each person signing this Amendment represents and warrants that he or she is duly authorized to execute this Amendment and to bind the Party authorizing his or her signature.

STATE OF COLORADO
Jared S. Polis, Governor
Department of Transportation
Shoshana M. Lew, Executive Director

_____
Keith Stefanik, P.E., Chief Engineer

Date: _____

LOCAL AGENCY
City of Pueblo

By:_____
*Signature

Name:_____
Heather Graham

Title:_____
(Mayor)

Date:_____

SECOND LOCAL AGENCY SIGNATURE
City of Pueblo

By:_____
*ATTEST

Name:_____
(Print Name)

Title:_____
(Print Title)

Date:_____

In accordance with §24-30-202 C.R.S., this Amendment is not valid until signed and dated below by the State Controller or an authorized delegate.

STATE CONTROLLER
Robert Jaros, CPA, MBA, JD

By:_____
Department of Transportation

Amendment Effective Date:_____

THE REST OF THIS PAGE IS LEFT INTENTIONALLY BLANK

1) PARTIES

This Amendment (the "Amendment") to the Original Agreement shown on the Signature and Cover Page for this Amendment (the "Agreement") is entered into by and between the Local Agency and the State.

2) TERMINOLOGY

Except as specifically modified by this Amendment, all terms used in this Amendment that are defined in the Agreement shall be construed and interpreted in accordance with the Agreement.

3) EFFECTIVE DATE AND ENFORCEABILITY

A. Amendment Effective Date

This Amendment shall not be valid or enforceable until the Amendment Effective Date shown on the Signature and Cover Page for this Amendment. The State shall not be bound by any provision of this Amendment before that Amendment Effective Date, and shall have no obligation to pay the Local Agency for any Work performed or expense incurred under this Amendment either before or after the Amendment term shown in **§3.B** of this Amendment

B. Amendment Term

The Parties' respective performances under this Amendment and the changes to the Agreement contained herein shall commence on the Amendment Effective Date shown on the Signature and Cover Page for this Amendment and shall terminate on the termination of the Agreement.

4) PURPOSE

The Parties originally entered into this Agreement on May 10, 2021, for Prairie Avenue to Minnequa Lake Trail improvements. Now the Parties desire to terminate the Agreement.

5) MODIFICATIONS

The Parties amend the Agreement as follows:

A. Reduce Agreement Maximum Amount from $1,410,542.00 to $1,354,010.04, to reflect final Project costs and invoicing;

B. The Parties desire to terminate the Agreement, with the execution of this Amendment, this Agreement is now terminated;

C. Replace **Exhibit C-6**, with **Exhibit C-7**, which is attached and incorporated herein.

6) LIMITS OF EFFECT

This Amendment is incorporated by reference into the Agreement, and the Agreement and all prior amendments or other modifications to the Agreement, if any, remain in full force and effect except as specifically modified in this Amendment. Except for the Special Provisions contained in the Agreement, in the event of any conflict, inconsistency, variance, or contradiction between the provisions of this Amendment and any of the provisions of the Agreement or any prior modification to the Agreement, the provisions of this Amendment shall in all respects supersede, govern, and control. The provisions of this Amendment shall only supersede, govern, and control over the Special Provisions contained in the Agreement to the extent that this Amendment specifically modifies those Special Provisions.

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EXHIBIT C-7 - FUNDING PROVISIONS

City of Pueblo - TAP M086-091 (24079)/ MTF M086-088 (24024)

A. Cost of Work Estimate

The Local Agency has estimated the total cost of the Work to be $1,354,010.04, which is to be funded as follows:

1. FUNDING

TAP M086-091 (24079)

a. Federal Funds
(100% of TAP Award) $194,000.00

b. Federal Funds ARPA **US Treasury Expenditure Category EC6**
(100% of ARPA Award) $980,187.74

MTF M086-088 (24024)

a. State Funds
(100% of MMOF Award) $179,822.30

TOTAL FUNDS ALL SOURCES	**$1,354,010.04**

2. OMB UNIFORM GUIDANCE

a.	Federal Award Identification Number (FAIN):	693JJ22330000Y306COM086091
b.	Name of Federal Awarding Agency:	FHWA, USDT
c.	Local Agency Unique Entity Identifier	NJK3BNUDRHJ7
d.	Assistance Listing #	
	Highway Planning and Construction	ALN 20.205
	Coronavirus State and Local Fiscal Recovery Funds	ALN 21.027
	Surface Transportation Block Program	ALN 20.287
e.	Is the Award for R&D?	No
f.	Indirect Cost Rate (if applicable)	N/A
g.	Amount of Federal Funds Obligated by this Action:	$0.00
h.	Amount of Federal Funds Obligated to Date (including this Action):	$1,174,187.74

3. ESTIMATED PAYMENT TO LOCAL AGENCY

a.	Federal Funds Budgeted	$194,000.00
b.	ARPA Funds Budgeted	$980,187.74
c.	State Funds Budgeted	$179,822.30
d.	Less Estimated Federal Share of CDOT-Incurred Costs	$0.00

TOTAL ESTIMATED PAYMENT TO LOCAL AGENCY	**100%**	**$1,354,010.04**
TOTAL ESTIMATED FUNDING BY LOCAL AGENCY	**0%**	**$0.00**
TOTAL PROJECT ESTIMATED FUNDING	**100.00%**	**$1,354,010.04**

4. FOR CDOT ENCUMBRANCE PURPOSES

TAP M086-091 (24079)
TAP Fed Funds

a.	Total Encumbrance Amount (Federal funds + Local Agency funds)	$194,000.00
b.	Less ROW Acquisition 3111 and/or ROW Relocation 3109	$0.00

ARPA Fed Funds

a.	Total Encumbrance Amount (Only ARPA funds are encumbered)	$980,187.74
b.	Less ROW Acquisition 3111 and/or ROW Relocation 3109	$0.00

MTF M086-091 (24024)
MMOF State Funds

a.	Total Encumbrance Amount (Only State funds are encumbered)	$179,822.30
b.	Less ROW Acquisition 3111 and/or ROW Relocation 3109	$0.00

NET TO BE ENCUMBERED BY CDOT IS AS FOLLOWS		**$1,354,010.04**
TAP Fed Funds		
Const. 3301		
WBS Element 24079.20.10	Performance Period Start*/End Date 03/08/2023 – 12/31/2025	$194,000.00
ARPA Fed Funds		
Const. 3301		
WBS Element 24079.20.10	Performance Period Start**/End Date 11/09/2022 – 12/11/2026	$980,187.74
MMOF State Funds		
Design 3020		
WBS Element 24024.10.30	Performance Period Start**/End Date N/A – N/A	$84,822.30
Const. 3301		
WBS Element 24024.20.10	Performance Period Start**/End Date N/A – N/A	$95,000.00

*The Local Agency should not begin work until all three (3) of the following are in place: 1) Phase Performance Period Start Date; 2) the execution of the document encumbering funds for the respective phase; and 3) Local Agency receipt of the official Notice to Proceed. Any work performed before these three (3) milestones are achieved will not be reimbursable.

**The Local Agency should not begin work until both of the following are in place: 1) the execution of the document encumbering funds for the respective phase; and 2) Local Agency receipt of the official Notice to Proceed. Any work performed before these two (2) milestones are achieved will not be reimbursable.

B. Funding Ratios

The funding ratio for the Federal funds for this Work is 100% Federal & State funds to 0% Local Agency funds, and this ratio applies only to the $1,354,010.04 that is eligible for Federal & State funding. All other costs are borne by the Local Agency at 100%. If the total cost of performance of the Work exceeds $1,354,010.04, and additional Federal & State funds are not available, the Local Agency shall pay all such excess costs. If the total cost of performance of the Work is less than $1,354,010.04, then the amounts of Local Agency and Federal & State funds will be decreased in accordance with the funding ratio described in **A1**. **This applies to the entire scope of Work.**

C. Maximum Amount Payable

The maximum amount payable to the Local Agency under this Agreement shall be $1,354,010.04. For CDOT accounting purposes, the federal funds of $1,174,187.74 and the State funds of $179,822.30 will be encumbered for a total encumbrance of $1,354,010.04. The total budget of this project is $1,354,010.04, unless this amount is increased by an executed amendment before any increased cost is incurred. The total cost of the Work is the best estimate available, based on the design data as approved at the time of execution of this Agreement, and that any cost is subject to revisions agreed to by the parties prior to bid and award. **This applies to the entire scope of Work. ARPA Funds can only originate from and after May 18, 2021.**

D. Single Audit Act Amendment

All state and local government and non-profit organizations receiving $1,000,000 or more from all funding sources defined as federal financial assistance for Single Audit Act Amendment purposes shall comply with the audit requirements of 2 CFR part 200, subpart F (Audit Requirements). The Single Audit Act Amendment requirements applicable to the Local Agency receiving federal funds are as follows:

i. **Expenditure less than $1,000,000**
If the Local Agency expends less than $1,000,000 in Federal funds (all federal sources, not just Highway funds) in its fiscal year then this requirement does not apply.

ii. **Expenditure of $1,000,000 or more-Highway Funds Only**
If the Local Agency expends $1,000,000 or more, in Federal funds, but only received federal Highway funds, then a program specific audit shall be performed. This audit will examine the “financial” procedures and processes for this program area.

iii. **Expenditure of $1,000,000 or more-Multiple Funding Sources**
If the Local Agency expends $1,000,000 or more in Federal funds, and the Federal funds are from multiple sources (FTA, HUD, NPS, etc.) then the Single Audit Act applies, which is an audit on the entire organization/entity.

iv. **Independent CPA**
Single Audit shall only be conducted by an independent CPA, not by an auditor on staff. An audit is an allowable direct or indirect cost.

GRANT CERTIFICATION

From: Kelly Grisham, Project Coordinator

To: Mark Aliff, President of the City Council
Heather Graham, Mayor

Re: Prairie Avenue to Minnequa Lake Trail – TAP M086-091 (24079)/MTF M086-088 (24024)

I hereby certify that I have reviewed and am familiar with the attached documents, and to the best of my knowledge and belief, the City has the present ability to comply with all special conditions, certifications and assurances therein contained.

Kelly Grisham _____ 5/5/2026

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Andrew Hayes, Public Works Director

SUBJECT: AN ORDINANCE APPROVING THE 1ST AMENDMENT TO THE INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION ("CITY"), AND THE STATE OF COLORADO, ACTING BY AND THROUGH THE COLORADO DEPARTMENT OF TRANSPORTATION ("CDOT"), ADAMS AND JACKSON ROUNDABOUT PROJECT SHO M086-093 (24462), DECREASING THE FUNDING FROM $1,000,000 TO $832,016.09 AND AUTHORIZING THE MAYOR TO EXECUTE SAME

SUMMARY:

This Ordinance approves the 1st Amendment of an Intergovernmental Agreement ("IGA") between the City of Pueblo, a Colorado Municipal Corporation ("City") and the State of Colorado, Colorado Department of Transportation ("CDOT") relating to the Adams and Jackson Roundabout Project by reducing the funding from $1,000,000.00 to $832,016.09.

PREVIOUS COUNCIL ACTION:

Project No. CI2206 Adams Avenue and Jackson Street Roundabout Project was established by Ordinance No. 10120, passed on February 14, 2022. The same Ordinance also budgeted and appropriated funds in the amount of $900,000.00 received from the Colorado Department of Transportation (CDOT) under the Highway Safety Improvement Program (HSIP) Grant.

Resolution 14860, dated April 25, 2022, authorized the transfer of $100,000.00 from Project Account CI2204 to Project Account CI2206.

Resolution 15069, dated November 28, 2022, awarded an agreement for professional engineering services in the amount of $123,014.74 to Short-Elliott-Hendrickson, Inc., for the design of Adams Avenue and Jackson Street Roundabout.

Resolution 15597, dated April 22, 2024, awarded a construction contract to Tony J. Beltrams & Sons, Inc., for Project No. 24-008, Construction of Adams Avenue and Jackson Street Roundabout.

BACKGROUND:

The intersection of Adams Avenue and Jackson Street was awarded a Highway Safety Improvement Program (HSIP) grant from the Federal Highway Administration (FHWA) through the Colorado Department of Transportation (CDOT). During the five-year time period 2015 to 2019, there were ten reported accidents, of which, two were fatal accidents, seven broadside, six property damage only and two injury accidents. FHWA has identified roundabout construction as one of the most significant accident countermeasure concepts. This project consists of the construction of a 'Mini-Roundabout' at the intersection of Adams Avenue and Jackson Street. The construction components include pavement and concrete removal, excavation and embankment, asphalt pavement with aggregate base course, concrete flatwork involving integral coloring and stamping, storm sewer relocation, signage and pavement markings, and traffic control.

The project, according to the Scope of Work contained in the IGA and all amendments, has been completed. The Amendment formalizes the return of the unused grant funds to the Highway Safety Improvements Program.

FINANCIAL IMPLICATIONS:

None.

BOARD/COMMISSION RECOMMENDATION:

None.

STAKEHOLDER PROCESS:

None.

ALTERNATIVES:

Denial of this Ordinance would deny returning the funds back to the State of Colorado.

RECOMMENDATION:

Approve the Ordinance.

ATTACHMENTS:

1. GRANT CERTIFICATION (signed)
2. Draft AM 1 Pueblo

ORDINANCE NO.

AN ORDINANCE APPROVING THE 1ST AMENDMENT TO THE INTERGOVERNMENTAL AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO MUNICIPAL CORPORATION ("CITY"), AND THE STATE OF COLORADO, ACTING BY AND THROUGH THE COLORADO DEPARTMENT OF TRANSPORTATION ("CDOT"), ADAMS AND JACKSON ROUNDABOUT PROJECT SHO M086-093 (24462), DECREASING THE FUNDING FROM $1,000,000 TO $832,016.09 AND AUTHORIZING THE MAYOR TO EXECUTE SAME

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The 1st Amendment to the Intergovernmental Agreement ("IGA") between the City of Pueblo, a Colorado Municipal Corporation, and State of Colorado, acting by and through the Colorado Department of Transportation (CDOT), Project: SHO M086-093 (24462), Adams and Jackson Roundabout Project, a copy of which is attached, having been approved as to form by the City Attorney, is hereby approved

SECTION 2.

The Mayor is authorized to execute and deliver the IGA 1st Amendment in the name of the City of Pueblo and the City Clerk is directed to affix the seal of the City thereto and attest same.

SECTION 3.

The officers of the City are authorized to perform any and all acts consistent with this Ordinance to implement the policies and procedures described herein.

SECTION 4.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

GRANT CERTIFICATION

From: Kelly Grisham, Project Coordinator

To: Mark Aliff, President of the City Council
Heather Graham, Mayor

Re: Adams and Jackson Roundabout – SHP M086-093 (24462)

I hereby certify that I have reviewed and am familiar with the attached documents, and to the best of my knowledge and belief, the City has the present ability to comply with all special conditions, certifications and assurances therein contained.

Kelly Grisham _____ 5/5/2026

STATE OF COLORADO AMENDMENT

Amendment #: 1 **Project #: SHO M086-093 (24462)**

SIGNATURE AND COVER PAGE

State Agency Department of Transportation	**Amendment Routing Number** 22-HA2-XC-00014-M0002
Local Agency City of Pueblo	**Original Agreement Routing Number** 22-HA2-XC-00014
Agreement Maximum Amount $832,016.09	**Agreement Beginning Date** March 29, 2022
	Agreement Expiration Date The earlier of the Amendment Effective Date or January 09, 2032

THE PARTIES HERETO HAVE EXECUTED THIS AMENDMENT

Each person signing this Amendment represents and warrants that he or she is duly authorized to execute this Amendment and to bind the Party authorizing his or her signature.

STATE OF COLORADO
Jared S. Polis, Governor
Department of Transportation
Shoshana M. Lew, Executive Director

_____
Keith Stefanik, P.E., Chief Engineer

Date: _____

LOCAL AGENCY
City of Pueblo

By:_____
*Signature

Name:_____
Heather Graham

Title:_____
Mayor

Date:_____

SECOND LOCAL AGENCY SIGNATURE
City of Pueblo

By:_____
*ATTEST

Name:_____
(Print Name)

Title:_____
(Print Title)

Date:_____

In accordance with §24-30-202 C.R.S., this Amendment is not valid until signed and dated below by the State Controller or an authorized delegate.

STATE CONTROLLER
Robert Jaros, CPA, MBA, JD

By:_____
Department of Transportation

Amendment Effective Date:_____

THE REST OF THIS PAGE IS LEFT INTENTIONALLY BLANK

1) PARTIES

This Amendment (the "Amendment") to the Original Agreement shown on the Signature and Cover Page for this Amendment (the "Agreement") is entered into by and between the Local Agency and the State.

2) TERMINOLOGY

Except as specifically modified by this Amendment, all terms used in this Amendment that are defined in the Agreement shall be construed and interpreted in accordance with the Agreement.

3) EFFECTIVE DATE AND ENFORCEABILITY

A. Amendment Effective Date

This Amendment shall not be valid or enforceable until the Amendment Effective Date shown on the Signature and Cover Page for this Amendment. The State shall not be bound by any provision of this Amendment before that Amendment Effective Date, and shall have no obligation to pay the Local Agency for any Work performed or expense incurred under this Amendment either before or after the Amendment term shown in **§3.B** of this Amendment

B. Amendment Term

The Parties' respective performances under this Amendment and the changes to the Agreement contained herein shall commence on the Amendment Effective Date shown on the Signature and Cover Page for this Amendment and shall terminate on the termination of the Agreement.

4) PURPOSE

The Parties originally entered into the Agreement on March 29, 2022, for Adams Ave and Jackson St. Roundabout improvements. Now the Parties desire to terminate the Agreement.

5) MODIFICATIONS

The Parties desire to amend the Agreement as follows:

A. Reduce Agreement Maximum Amount from $1,000,000.00 to $832,016.09, to reflect final Project costs and invoicing;

B. The Parties desire to terminate the Agreement, with the execution of this Amendment, this Agreement is now terminated;

C. Replace **Exhibit C-4**, with **Exhibit C-5**, which is attached and incorporated herein.

6) LIMITS OF EFFECT

This Amendment is incorporated by reference into the Agreement, and the Agreement and all prior amendments or other modifications to the Agreement, if any, remain in full force and effect except as specifically modified in this Amendment. Except for the Special Provisions contained in the Agreement, in the event of any conflict, inconsistency, variance, or contradiction between the provisions of this Amendment and any of the provisions of the Agreement or any prior modification to the Agreement, the provisions of this Amendment shall in all respects supersede, govern, and control. The provisions of this Amendment shall only supersede, govern, and control over the Special Provisions contained in the Agreement to the extent that this Amendment specifically modifies those Special Provisions.

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EXHIBIT C-5 - FUNDING PROVISIONS

City of Pueblo # SHO M086-093 (24462)

A. Cost of Work Estimate

The Local Agency has estimated the total cost of the Work to be $832,016.09, which is to be funded as follows:

1. FUNDING

a. Federal Funds (90% of HSIP Award)	$748,815.00
b. Local Agency Funds (10% of HSIP Award)	$83,201.09
TOTAL FUNDS ALL SOURCES	**$832,016.09**

2. OMB UNIFORM GUIDANCE

a.	Federal Award Identification Number (FAIN):	693JJ22530000ZS3ECOM086093 693JJ22330000YS32COM086093 693JJ22530000YS30COM086093
b.	Name of Federal Awarding Agency:	FHWA
c.	Local Agency Unique Entity Identifier	NJK3BNUDRHJR
d.	Assistance Listing #	
	Highway Planning and Construction	ALN 20.205
	Highway Safety Improvement Program	ALN 20.272
e.	Is the Award for R&D?	No
f.	Indirect Cost Rate (if applicable)	N/A
g.	Amount of Federal Funds Obligated by this Action:	$0.00
h.	Amount of Federal Funds Obligated to Date (including this Action):	$748,815.00

3. ESTIMATED PAYMENT TO LOCAL AGENCY

a.	Federal Funds Budgeted	$748,815.00
b.	Less Estimated Federal Share of CDOT-Incurred Costs	$0.00

TOTAL ESTIMATED PAYMENT TO LOCAL AGENCY	**90%**	**$748,815.00**
TOTAL ESTIMATED FUNDING BY LOCAL AGENCY	**10%**	**$83,201.09**
TOTAL PROJECT ESTIMATED FUNDING	**100.00%**	**$832,016.09**

4. FOR CDOT ENCUMBRANCE PURPOSES

a.	Total Encumbrance Amount (Federal funds + Local Agency funds)	$832,016.09
b.	Less ROW Acquisition 3111 and/or ROW Relocation 3109	$0.00
NET TO BE ENCUMBERED BY CDOT IS AS FOLLOWS		**$832,016.09**

Design 3020 WBS Element 24462.10.30	Performance Period Start*/End Date 12/14/2022 – 12/31/2025	$117,572.16
Const. 3301 WBS Element 24462.20.10	Performance Period Start*/End Date 03/05/2024 – 12/31/2025	$714,443.93

*The Local Agency should not begin work until all three (3) of the following are in place: 1) Phase Performance Period Start Date; 2) the execution of the document encumbering funds for the respective phase; and 3) Local Agency receipt of the official Notice to Proceed. Any work performed before these three (3) milestones are achieved will not be reimbursable.

B. Funding Ratios

The funding ratio for the Federal funds for this Work is 90% Federal funds to 10% Local Agency funds, and this ratio applies only to the $832,016.09 that is eligible for Federal funding. All other costs are borne by the Local Agency at 100%. If the total cost of performance of the Work exceeds $832,016.09, and additional Federal funds are not available, the Local Agency shall pay all such excess costs. If the total cost of performance of the Work is less than $832,016.09, then the amounts of Local Agency and Federal funds will be decreased in accordance with the funding ratio described in **A1**. **This applies to the entire scope of Work.**

C. Maximum Amount Payable

The maximum amount payable to the Local Agency under this Agreement shall be $748,815.00. For CDOT accounting purposes, the Federal funds of $748,815.00 and the Local Agency funds of $83,201.09 will be encumbered for a total encumbrance of $832,016.09. The total budget of this funding source is $832,016.09, unless this amount is increased by an executed amendment before any increased cost is incurred. The total cost of the Work is the best estimate available, based on the design data as approved at the time of execution of this Agreement, and that any cost is subject to revisions agreed to by the parties prior to bid and award. **This applies to the entire scope of Work.**

D. Single Audit Act Amendment

All state and local government and non-profit organizations receiving $1,000,000 or more from all funding sources defined as Federal Financial Assistance for Single Audit Act Amendment purposes shall comply with the audit requirements of 2 CFR part 200, subpart F (Audit Requirements). The Single Audit Act Amendment requirements applicable to the Local Agency receiving Federal funds are as follows:

i. **Expenditure less than $1,000,000**
If the Local Agency expends less than $1,000,000 in Federal funds (all Federal sources, not just Highway funds) in its fiscal year then this requirement does not apply.

ii. **Expenditure of $1,000,000 or more-Highway Funds Only**
If the Local Agency expends $1,000,000 or more, in Federal funds, but only received Federal Highway funds then a program specific audit shall be performed. This audit will examine the “financial” procedures and processes for this program area.

iii. **Expenditure of $1,000,000 or more-Multiple Funding Sources**
If the Local Agency expends $1,000,000 or more in Federal funds, and the

Federal funds are from multiple sources (FTA, HUD, NPS, etc.) then the Single Audit Act applies, which is an audit on the entire organization/entity.

iv. Independent CPA

Single Audit shall only be conducted by an independent CPA, not by an auditor on staff. An audit is an allowable direct or indirect cost.

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Andrew Hayes, Public Works Director

SUBJECT: AN ORDINANCE AMENDING SECTION 607 OF CHAPTER 1 OF TITLE XI OF THE PUEBLO MUNICIPAL CODE RELATING TO NOISE AND CLARIFYING AND RECOGNIZING CONSISTENT WITH STATE STATUTE ITS NONAPPLICATION TO THE STATE, POLITICAL SUBDIVISIONS OF THE STATE AND NONPROFITS

SUMMARY:

Section 11-1-607, P.M.C., is the City's noise abatement ordinance ("City's NAA"). The proposed ordinance amends City's NAA to clarify and recognize consistent with state statute its nonapplication to the State, political subdivision of the State and nonprofits when holding cultural, entertainment, athletic, or patriotic events, including, but not limited to, concerts, music festivals, and fireworks displays.

PREVIOUS COUNCIL ACTION:

The City's NAA has not been updated since June 14, 2010.

BACKGROUND:

Colorado's Noise Abatement Act ("State NAA"), §§ 25-12-101 to -110, C.R.S. establishes statewide standards for noise level limits based on zoning and time of day. The State NAA allows local governments to adopt standards that are no less restrictive than those provided by the State NAA. The City's NAA is such a local adoption. The State NAA has been amended to exclude and does not apply to cultural, entertainment, athletic, or patriotic events, including, but not limited to, concerts, music festivals, and fireworks displays, when conducted by the government or a non-profit organization. § 25-12-103(11), C.R.S. (2024). The proposed ordinance expressly adopts the same exclusion.

FINANCIAL IMPLICATIONS:

None anticipated.

BOARD/COMMISSION RECOMMENDATION:

Not applicable.

STAKEHOLDER PROCESS:

Not applicable.

ALTERNATIVES:

Not adopt the Ordinance in which case it would remain unclear as to application to concerts, music festivals, and fireworks displays, when conducted by the government or a non-profit organization.

RECOMMENDATION:

Approve the Ordinance.

ATTACHMENTS:

None

ORDINANCE NO.

AN ORDINANCE AMENDING SECTION 607 OF CHAPTER 1 OF TITLE XI OF THE PUEBLO MUNICIPAL CODE RELATING TO NOISE AND CLARIFYING AND RECOGNIZING CONSISTENT WITH STATE STATUTE ITS NONAPPLICATION TO THE STATE, POLITICAL SUBDIVISIONS OF THE STATE AND NONPROFITS

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Subsection (d) of Section 607 of Chapter 1, Title XI of the Pueblo Municipal Code is hereby amended by the addition of a new paragraph (10) thereto to read as follows:

(10) This Section is not applicable to the use of property by the State, any political subdivision of the State, or any other entity not organized for profit, including, but not limited to, nonprofit corporations, or any of their lessees, licensees, or permittees, for the purpose of promoting, producing, or holding cultural, entertainment, athletic, or patriotic events, including, but not limited to, concerts, music festivals, and fireworks displays. This subsection (10) shall not be construed to preempt or limit the authority of the City to otherwise regulate noise abatement.

SECTION 2.

The officers and staff of the City are authorized and directed to perform any and all acts consistent with the intent of this Ordinance to effectuate the policies and procedures described herein.

SECTION 3.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Melissa Cook, Director Department of Housing & Citizen Services

SUBJECT: AN ORDINANCE APPROVING AND ADOPTING THE CITY OF PUEBLO'S 2026 ACTION PLAN FOR THE COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG) AND THE HOME INVESTMENT PARTNERSHIP ACT GRANT (HOME), AUTHORIZING THE MAYOR OF THE CITY OF PUEBLO TO SUBMIT THE APPLICATION TOGETHER WITH ALL REQUIRED AND NECESSARY CERTIFICATIONS, ASSURANCES, AND DOCUMENTATION TO THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, AND APPROPRIATING AND BUDGETING CDBG AND HOME FUNDS THEREFORE AND AUTHORIZING THE MAYOR TO EXECUTE SUBRECIPIENT AGREEMENTS FOR COMMUNITY DEVELOPMENT SERVICES

SUMMARY:

This Ordinance approves the 2026 Action Plan as presented. The Action Plan contains the funding recommendations made by the Citizens' Advisory Committee (CAC) and Staff.
On April 10, 2026, the City of Pueblo was notified by Housing and Urban Development (HUD) of the 2026 award amounts:
CDBG - $1,433,918
HOME - $773,965.49

PREVIOUS COUNCIL ACTION:

Ordinance #10985 was passed on July 14, 2025, approving and adopting the City of Pueblo's five-year (2025-2029) Consolidated Plan for the Community Development Block Grant and the HOME Investment Partnership Act Grant, which serves as the guiding document for this Action Plan.

BACKGROUND:

As an entitlement city, the City of Pueblo is required by the U.S. Department of Housing

and Urban Development (HUD) to complete an Annual Action Plan for each of the years of the Consolidated Plan. This Action Plan and the accompanying documentation serve as the City's application to HUD for the 2026 Community Development Block Grant (CDBG) and HOME Investment Partnership Act Grant (HOME). This is the second Action Plan under the 2025-2029 Five-Year Consolidated Plan.
A public meeting was held to receive citizen input and to hear applicant presentations on July 15, 2025. The notice of the availability of the 2026 Annual Action Plan was published on April 19, 2026 and made available to the public for review on the same day, formally opening the public comment period for thirty days.

This ordinance will also authorize the Mayor to execute Community Development Services Agreements for the following organizations as outlined in the attached 2026 Annual Action Plan Draft Attachment A.

Public Services

CD2602	Supportive Services	Posada	$ 95,195.00
CD2603	Housing Stabilization	Catholic Charities	$ 25,000.00
CD2604	Charity Works	Catholic Charities	$ 35,000.00
CD2605	Senior Transportation	SRDA	$ 59,892.00

FINANCIAL IMPLICATIONS:

The City anticipates receiving $1,433,918.00 in CDBG funding and $ 773,865.49 in HOME Consortium grant funding. The HOME Consortium grant is shared with Pueblo County on an 87%/13% City/County basis. The HOME grant requires a 25% match. The City's portion this year is $174,119.00 and was budgeted and appropriated in the 2026 annual budget, approved on November 16, 2025.

This ordinance budgets and appropriates based on the attached 2026 Annual Action Plan Draft Attachment A.

BOARD/COMMISSION RECOMMENDATION:

The Citizens Advisory Committee (CAC) has recommended that the City Council approve the activities outlined in the 2026 Action Plan, which were presented Council during Work Session on May 4, 2026.

STAKEHOLDER PROCESS:

The following stakeholder processes were undertaken by the Department. Starting May 1, 2025 through May 31, 2025, applications for grant funding were made available to the community. Public hearings were held in Council Chambers following the Citizen Advisory Committee applicant presentations on July 15, 2025. The public hearings were open for public comments, and for funding applicants to present their requests to the CAC. No public comments were received.
The 30-day comment period began April 19, 2026, with the publication of a public notice in *The Pueblo Chieftain* and online at www.pueblo.us/95.

ALTERNATIVES:

The City Council can choose not to apply for the CDBG and HOME grants, in which case a number of community services and community projects will need to find alternative funding.

RECOMMENDATION:

Approval of the Ordinance.
Note: If council action is delayed after June, 2026, it will put the City of Pueblo in jeopardy of not receiving this funding. The final date for HUD to accept the Annual Action Plan is July 17, 2026 and it is advisable to give HUD a minimum of two weeks to review, making the submittal goal of no later than July 3, 2026.

ATTACHMENTS:

1. 2026 Attachment A Draft
2. Application for Federal Assistance 424 CDBG
3. Application for Federal Assistance 424 HOME
4. Certifications and Assurances - HUD SF 424B
5. Certifications
6. FY26 CPD Formula Letters - Pueblo, CO
7. CD2602 Program Summary and Recommendation, Posada SSO
8. CD2603 Program Summary and Recommendation, Catholic Charities, Housing Stabilization
9. CD2604 Program Summary and Recommendation, Catholic Charities, Charity Works
10. CD2605 Program Summary and Recommendation, SRDA, Transportation
11. Draft Community Development Services Agreement
12. Annual Action plan Draft Microsoft

ORDINANCE NO.

AN ORDINANCE APPROVING AND ADOPTING THE CITY OF PUEBLO'S 2026 ACTION PLAN FOR THE COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG) AND THE HOME INVESTMENT PARTNERSHIP ACT GRANT (HOME), AUTHORIZING THE MAYOR OF THE CITY OF PUEBLO TO SUBMIT THE APPLICATION TOGETHER WITH ALL REQUIRED AND NECESSARY CERTIFICATIONS, ASSURANCES, AND DOCUMENTATION TO THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, AND APPROPRIATING AND BUDGETING CDBG AND HOME FUNDS THEREFORE AND AUTHORIZING THE MAYOR TO EXECUTE SUBRECIPIENT AGREEMENTS FOR COMMUNITY DEVELOPMENT SERVICES

WHEREAS, the City of Pueblo is designated as an entitlement city under the Housing and Community Development Act of 1974, and will receive Community Development Block Grant (CDBG) and HOME Investment Partnership Act Grants (HOME) for fiscal year 2026; and

WHEREAS, the City of Pueblo conducted a citizen participation process that included two public hearings within the City of Pueblo in addition to a third public hearing before City Council to obtain the views of citizens, non-profit and neighborhood groups on the City's housing and community needs; NOW THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The City Council hereby finds and determines that the City of Pueblo's 2026 Action Plan listing projects and programs for funding from CDBG and HOME federal funds has been developed to give maximum feasible priority to activities which will benefit low- to moderate-income families and/or aid in the prevention or elimination of slum and blight, as required by HUD, and is hereby approved, adopted, and incorporated herein.

SECTION 2.

The Mayor is hereby authorized to submit, in the name of the City of Pueblo, the applications (SF-424/SF-424D) and the 2026 Action Plan, together with all required and necessary certifications, assurances, and documentation to the U.S. Department of Housing and Urban Development for $1,433,918.00 in 2026 CDBG funds and $ 773,865.49 in 2026 HOME funds.

SECTION 3.

CDBG funds in the amount of $1,433,918.00 and HOME funds in the amount of $ 773,865.49, the 2026 allocation, are hereby budgeted and appropriated for the projects and in the amounts set forth in the 2026 Action Plan. A list of the recommended projects is herein

included as Attachment A, which will become finalized after council action.

SECTION 4.

The HOME Program requires local matching funds. The City's portion of matching funds for the 2026 year is $174,119.74. During the 2026 budget process, $200,000.00 was budgeted and appropriated for the HOME match.

SECTION 5.

The officers and staff of the City are authorized to perform any and all acts consistent with this Ordinance to implement the policies and procedures described herein.

SECTION 6.

If any section, paragraph, clause, or provision of this Ordinance shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such section, paragraph, clause, or provision shall not affect any of the remaining provisions of this Ordinance.

SECTION 7.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

SECTION 8.

The Mayor is authorized to execute Community Development Services Agreements for the following organizations as outlined in the attached 2026 Annual Action Plan.

Public Services

CD2602	Supportive Services	Posada	$ 95,195.00
CD2603	Housing Stabilization	Catholic Charities	$ 25,000.00
CD2604	Charity Works	Catholic Charities	$ 35,000.00
CD2605	Senior Transportation	SRDA	$ 59,892.00

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

2026 Annual Action Plan Draft

Attachment A

Community Development Block Grant Program Funds			
2026	**CDBG Allocation**		**$ 1,433,918.00**
Project No.	**Project Name**	**Project Agency**	**Amount**
	Public Services		
CD2601	Administration	DHCS	$ 286,783.00
CD2602	Supportive Services	Posada	$ 95,195.00
CD2603	Housing Stabilization	Catholic Charities	$ 25,000.00
CD2604	Charity Works	Catholic Charities	$ 35,000.00
CD2605	Senior Transportation	SRDA	$ 59,892.00
	Public Facilities/Neighborhood Improvements		
CD2606	Portland Park Basketball Resurfacing	Citizen Request	$ 50,000.00
CD2607	Neighborhood Revitalization	City of Pueblo	$ 11,858.00
CD2608	Demolition of Dangerous Buildings	City of Pueblo	$ 420,000.00
CD2609	ADA Sidewalk Repair	City of Pueblo	$ 225,190.00
	Housing Activities		
CD2610	ERESP	Pueblo County	$ 50,000.00
CD2611	Rehabilitation	City of Pueblo	$ 175,000.00
		CDBG Total	**$ 1,433,918.00**
HOME Partnership Investement Act Program Funds			
2026	**HUD HOME Allocation**		**$ 773,865.49**
Project No.	**Project Name**	**Project Agency**	**Amount**
HO2610	City Administration	City of Pueblo	$ 67,326.30
HO2620	County Administration	Pueblo County	$ 10,060.25
HO2630	County Programs	Pueblo County	$ 70,421.76
HO2640	Community Housing Development Organization	TBD	$ 116,079.82
HO2650	City Programs	City of Pueblo	$ 471,284.08
HO2660	City Match	City of Pueblo	$ 174,119.74
HO2670	CHDO Operating	TBD	$ 38,693.27
		Allocation w/ City Match	**$ 947,985.23**

OMB Number: 4040-0004
Expiration Date: 03/31/2029

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received:

4. Applicant Identifier:

5a. Federal Entity Identifier: 14.218

5b. Federal Award Identifier: B-26-MC-08-007

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: City of Pueblo

* b. Employer/Taxpayer Identification Number (EIN/TIN): 84-6000615

* c. UEI: NJK3BNUDR7

d. Address:

* Street1: 1 City Hall Place
Street2:
* City: Pueblo
County/Parish:
* State: CO: Colorado
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 81003-1427

e. Organizational Unit:

Department Name: Housing and Citizen Services

Division Name: N/A

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:
* First Name: Melissa
Middle Name:
* Last Name: Cook
Suffix:

Title: Director of Housing and Citizen Services

Organizational Affiliation: City of Pueblo

* Telephone Number: 719-553-2849
Fax Number:

* Email: mcook@pueblo.us

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

C: City or Township Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Department of Housing and Urban Development

11. Assistance Listing Number:

14.218

Assistance Listing Title:

Community Development Block Grant

*** 12. Funding Opportunity Number:**

* Title:

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Community Development Block Grant (CDBG) funds to assist the City of Pueblo with housing and community development activities.

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: 3 | * b. Program/Project: 3

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 09/01/2026 | * b. End Date: 08/31/2027

18. Estimated Funding ($):

* a. Federal	1,433,918.00
* b. Applicant	
* c. State	
* d. Local	
* e. Other	
* f. Program Income	
* g. TOTAL	1,433,918.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: | * First Name: Heather

Middle Name:

* Last Name: Graham

Suffix:

* Title: Mayor

* Telephone Number: 719-553-2655 | Fax Number:

* Email: mayor@pueblo.us

* Signature of Authorized Representative: | * Date Signed:

OMB Number: 4040-0004
Expiration Date: 03/31/2029

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received:

4. Applicant Identifier:

5a. Federal Entity Identifier: 14.239

5b. Federal Award Identifier: M-26-DC-08-0205

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: City of Pueblo

* b. Employer/Taxpayer Identification Number (EIN/TIN): 84-6000615

* c. UEI: NJK3BNUDR7

d. Address:

* Street1: 1 City Hall Place
Street2:
* City: Pueblo
County/Parish:
* State: CO: Colorado
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 81003-1427

e. Organizational Unit:

Department Name: Housing and Citizen Services

Division Name: N/A

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:
* First Name: Melissa
Middle Name:
* Last Name: Cook
Suffix:

Title: Director of Housing and Citizen Services

Organizational Affiliation: City of Pueblo

* Telephone Number: 719-553-2849
Fax Number:

* Email: mcook@pueblo.us

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

C: City or Township Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Department of Housing and Urban Development

11. Assistance Listing Number:

14.239

Assistance Listing Title:

HOME Investment Partnership Program

*** 12. Funding Opportunity Number:**

* Title:

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

HOME Investment Partnership Program (HOME) funds to assist the City of Pueblo with developing and maintaining affordable housing.

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: 3 | * b. Program/Project: 3

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 09/01/2026 | * b. End Date: 08/31/2027

18. Estimated Funding ($):

* a. Federal	773,865.49
* b. Applicant	
* c. State	
* d. Local	
* e. Other	
* f. Program Income	
* g. TOTAL	773,865.49

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: | * First Name: Heather

Middle Name:

* Last Name: Graham

Suffix:

* Title: Mayor

* Telephone Number: 719-553-2655 | Fax Number:

* Email: mayor@pueblo.us

* Signature of Authorized Representative: | * Date Signed:

Applicant and Recipient Assurances and Certifications

U.S. Department of Housing and Urban Development

OMB Number: 2501-0044
Expiration Date: 2/28/2027

Instructions for the HUD 424-B Assurances and Certifications

As part of your application for HUD funding, you, as the official authorized to sign on behalf of your organization or as an individual, must provide the following assurances and certifications. The Responsible Civil Rights Official has specified this form for use for purposes of general compliance with 24 CFR §§ 1.5, 3.115, 8.50, and 146.25, as applicable. The Responsible Civil Rights Official may require specific civil rights assurances to be furnished consistent with those authorities and will specify the form on which such assurances must be made. A failure to furnish or comply with the civil rights assurances contained in this form may result in the procedures to effect compliance at 24 CFR §§ 1.8, 3.115, 8.57, or 146.39.

By submitting this form, you are stating that all assertions made in this form are true, accurate, and correct.

As the duly representative of the applicant, I certify that the applicant: [Insert below the Name and title of the Authorized Representative, name of Organization and the date of signature]:

*Authorized Representative Name:

*Title:

*Applicant/Recipient Organization:

1. Has the legal authority to apply for Federal assistance, has the institutional, managerial and financial capability (including funds to pay the non-Federal share of program costs) to plan, manage and complete the program as described in the application and the governing body has duly authorized the submission of the application, including these assurances and certifications, and authorized me as the official representative of the application to act in connection with the application and to provide any additional information as may be required.

2. Will administer the grant in compliance with Title VI of the Civil Rights Act of 1964 (42 U.S.C 2000(d)) and implementing regulations (24 CFR part 1), which provide that no person in the United States shall, on the grounds of race, color or national origin, be excluded from participation in, be denied the benefits of, or otherwise be subject to discrimination under any program or activity that receives Federal financial assistance OR if the applicant is a Federally recognized Indian tribe or its tribally designated housing entity, is subject to the Indian Civil Rights Act (25 U.S.C. 1301-1303).

3. Will administer the grant in compliance with Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794), as amended, and implementing regulations at 24 CFR part 8, the American Disabilities Act (42 U.S.C. §§ 12101 et.seq.), and implementing regulations at 28 CFR part 35 or 36, as applicable, and the Age Discrimination Act of 1975 (42 U.S.C. 6101-07) as amended, and implementing regulations at 24 CFR part 146 which together provide that no person in the United States shall, on the grounds of disability or age, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity that receives Federal financial assistance; except if the grant program authorizes or limits participation to designated populations, then the applicant will comply with the nondiscrimination requirements within the designated population.

4. Will comply with the Fair Housing Act (42 U.S.C. 3601-19), as amended, and the implementing regulations at 24 CFR part 100, which prohibit discrimination in housing on the basis of race, color, religion, sex, disability, familial status, or national origin and will affirmatively further fair housing; except an applicant which is an Indian tribe or its instrumentality which is excluded by statute from coverage does not make this certification; and further except if the grant program authorizes or limits participation to designated populations, then the applicant will comply with the nondiscrimination requirements within the designated population.

5. Will comply with all applicable Federal nondiscrimination requirements, including those listed at 24 CFR §§ 5.105(a) and 5.106 as applicable.

6. Will not use Federal funding to promote diversity, equity, and inclusion (DEI) mandates, policies, programs, or activities that violate any applicable Federal anti-discrimination laws.

7. Will comply with the acquisition and relocation requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 U.S.C. 4601) and implementing regulations at 49 CFR part 24 and, as applicable, Section 104(d) of the Housing and Community Development Act of 1974 (42 U.S.C. 5304(d)) and implementing regulations at 24 CFR part 42, subpart A.

8. Will comply with the environmental requirements of the National Environmental Policy Act (42 U.S.C. 4321 et.seq.) and related Federal authorities prior to the commitment or expenditure of funds for property.

9. That no Federal appropriated funds have been paid, or will be paid, by or on behalf of the applicant, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress, in connection with the awarding of this Federal grant or its extension, renewal, amendment or modification. If funds other than Federal appropriated funds have or will be paid for influencing or attempting to influence the persons listed above, I shall complete and submit Standard Form-LLL, Disclosure Form to Report Lobbying. I certify that I shall require all subawards at all tiers (including sub-grants and contracts) to similarly certify and disclose accordingly. Federally recognized Indian Tribes and tribally designated housing entities (TDHEs) established by Federally-recognized Indian tribes as a result of the exercise of the tribe's sovereign power are excluded from coverage by the Byrd Amendment, but State-recognized Indian tribes and TDHEs established under State law are not excluded from the statute's coverage.

I/We, the undersigned, certify under penalty of perjury that the information provided above is true, accurate, and correct. WARNING: Anyone who knowingly submits a false claim or makes a false statement is subject to criminal and/or civil penalties, including confinement for up to 5 years, fines, and civil and administrative penalties. (18 U.S.C. §§287, 1001, 1010, 1012, 1014; 31 U.S.C. §3729, 3802; 24 CFR §28.10(b)(1)(iii)).

* Signature:

* Date: (mm/dd/yyyy):

Public Reporting Burden Statement: The public reporting burden for this collection of information is estimated to average 0.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering, and maintaining the data needed, and completing and reviewing the collection of information. Comments regarding the accuracy of this burden estimate and any suggestions for reducing this burden can be sent to: U.S. Department of Housing and Urban Development, Office of the Chief Data Officer, R, 451 7th St SW, Room 4176, Washington, DC 20410-5000. **Do not send completed HUD 424-B forms to this address.** This agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the collection displays a valid OMB control number. The Department of Housing and Urban Development is authorized to collect this information under the authority cited in the Notice of Funding Opportunity for this grant program. The information collected provides assurances and certifications for legal requirements related to the administration of this grant program. HUD will use this information to ensure compliance of its grantees. This information is required to obtain the benefit sought in the grant program. This information will not be held confidential and may be made available to the public in accordance with the Freedom of Information Act (5 U.S.C. §552).

CERTIFICATIONS

In accordance with the applicable statutes and the regulations governing the consolidated plan regulations, the jurisdiction certifies that:

Affirmatively Further Fair Housing --The jurisdiction will affirmatively further fair housing.

Uniform Relocation Act and Anti-displacement and Relocation Plan -- It will comply with the acquisition and relocation requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, (42 U.S.C. 4601-4655) and implementing regulations at 49 CFR Part 24. It has in effect and is following a residential anti-displacement and relocation assistance plan required under 24 CFR Part 42 in connection with any activity assisted with funding under the Community Development Block Grant or HOME programs.

Anti-Lobbying --To the best of the jurisdiction's knowledge and belief:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of it, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement;

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, it will complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions; and

3. It will require that the language of paragraph 1 and 2 of this anti-lobbying certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

Authority of Jurisdiction --The consolidated plan is authorized under State and local law (as applicable) and the jurisdiction possesses the legal authority to carry out the programs for which it is seeking funding, in accordance with applicable HUD regulations.

Consistency with plan --The housing activities to be undertaken with Community Development Block Grant, HOME, Emergency Solutions Grant, and Housing Opportunities for Persons With AIDS funds are consistent with the strategic plan in the jurisdiction’s consolidated plan.

Section 3 -- It will comply with section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. 1701u) and implementing regulations at 24 CFR Part 75.

_____ _____

Signature of Authorized Official Date

_____

Title

Specific Community Development Block Grant Certifications

The Entitlement Community certifies that:

Citizen Participation -- It is in full compliance and following a detailed citizen participation plan that satisfies the requirements of 24 CFR 91.105.

Community Development Plan -- Its consolidated plan identifies community development and housing needs and specifies both short-term and long-term community development objectives that that have been developed in accordance with the primary objective of the CDBG program (i.e., the development of viable urban communities, by providing decent housing and expanding economic opportunities, primarily for persons of low and moderate income) and requirements of 24 CFR Parts 91 and 570.

Following a Plan -- It is following a current consolidated plan that has been approved by HUD.

Use of Funds -- It has complied with the following criteria:

1. Maximum Feasible Priority. With respect to activities expected to be assisted with CDBG funds, it has developed its Action Plan so as to give maximum feasible priority to activities which benefit low- and moderate-income families or aid in the prevention or elimination of slums or blight. The Action Plan may also include CDBG-assisted activities which the grantee certifies are designed to meet other community development needs having particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community, and other financial resources are not available (see Optional CDBG Certification).

2. Overall Benefit. The aggregate use of CDBG funds, including Section 108 guaranteed loans, during program year(s) _____[a period specified by the grantee of one, two, or three specific consecutive program years], shall principally benefit persons of low and moderate income in a manner that ensures that at least 70 percent of the amount is expended for activities that benefit such persons during the designated period.

3. Special Assessments. It will not attempt to recover any capital costs of public improvements assisted with CDBG funds, including Section 108 loan guaranteed funds, by assessing any amount against properties owned and occupied by persons of low and moderate income, including any fee charged or assessment made as a condition of obtaining access to such public improvements.

However, if CDBG funds are used to pay the proportion of a fee or assessment that relates to the capital costs of public improvements (assisted in part with CDBG funds) financed from other revenue sources, an assessment or charge may be made against the property with respect to the public improvements financed by a source other than CDBG funds.

In addition, in the case of properties owned and occupied by moderate-income (not low-income) families, an assessment or charge may be made against the property for public improvements financed by a source other than CDBG funds if the jurisdiction certifies that it lacks CDBG funds to cover the assessment.

Excessive Force -- It has adopted and is enforcing:

1. A policy prohibiting the use of excessive force by law enforcement agencies within its jurisdiction against any individuals engaged in non-violent civil rights demonstrations; and

2. A policy of enforcing applicable State and local laws against physically barring entrance to or exit from a facility or location which is the subject of such non-violent civil rights demonstrations within its jurisdiction.

Compliance with Anti-discrimination laws -- The grant will be conducted and administered in conformity with title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d) and the Fair Housing Act (42 U.S.C. 3601-3619) and implementing regulations.

Lead-Based Paint -- Its activities concerning lead-based paint will comply with the requirements of 24 CFR Part 35, Subparts A, B, J, K and R.

Compliance with Laws -- It will comply with applicable laws.

_____ _____

Signature of Authorized Official Date

_____

Title

OPTIONAL Community Development Block Grant Certification

Submit the following certification only when one or more of the activities in the action plan are designed to meet other community development needs having particular urgency as specified in 24 CFR 570.208(c):

The grantee hereby certifies that the Annual Plan includes one or more specifically identified CDBG-assisted activities which are designed to meet other community development needs having particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community and other financial resources are not available to meet such needs.

_____ _____

Signature of Authorized Official Date

_____

Title

Specific HOME Certifications

The HOME participating jurisdiction certifies that:

Tenant Based Rental Assistance -- If it plans to provide tenant-based rental assistance, the tenant-based rental assistance is an essential element of its consolidated plan.

Eligible Activities and Costs -- It is using and will use HOME funds for eligible activities and costs, as described in 24 CFR §§92.205 through 92.209 and that it is not using and will not use HOME funds for prohibited activities, as described in §92.214.

Subsidy layering -- Before committing any funds to a project, it will evaluate the project in accordance with the guidelines that it adopts for this purpose and will not invest any more HOME funds in combination with other Federal assistance than is necessary to provide affordable housing;

_____ _____

Signature of Authorized Official Date

_____

Title

Emergency Solutions Grants Certifications

The Emergency Solutions Grants Program recipient certifies that:

Major rehabilitation/conversion/renovation – If an emergency shelter's rehabilitation costs exceed 75 percent of the value of the building before rehabilitation, the recipient will maintain the building as a shelter for homeless individuals and families for a minimum of 10 years after the date the building is first occupied by a homeless individual or family after the completed rehabilitation.

If the cost to convert a building into an emergency shelter exceeds 75 percent of the value of the building after conversion, the recipient will maintain the building as a shelter for homeless individuals and families for a minimum of 10 years after the date the building is first occupied by a homeless individual or family after the completed conversion.

In all other cases where ESG funds are used for renovation, the recipient will maintain the building as a shelter for homeless individuals and families for a minimum of 3 years after the date the building is first occupied by a homeless individual or family after the completed renovation.

Essential Services and Operating Costs – In the case of assistance involving shelter operations or essential services related to street outreach or emergency shelter, the recipient will provide services or shelter to homeless individuals and families for the period during which the ESG assistance is provided, without regard to a particular site or structure, so long the recipient serves the same type of persons (e.g., families with children, unaccompanied youth, disabled individuals, or victims of domestic violence) or persons in the same geographic area.

Renovation – Any renovation carried out with ESG assistance shall be sufficient to ensure that the building involved is safe and sanitary.

Supportive Services – The recipient will assist homeless individuals in obtaining permanent housing, appropriate supportive services (including medical and mental health treatment, victim services, counseling, supervision, and other services essential for achieving independent living), and other Federal State, local, and private assistance available for these individuals.

Matching Funds – The recipient will obtain matching amounts required under 24 CFR 576.201.

Confidentiality – The recipient has established and is implementing procedures to ensure the confidentiality of records pertaining to any individual provided family violence prevention or treatment services under any project assisted under the ESG program, including protection against the release of the address or location of any family violence shelter project, except with the written authorization of the person responsible for the operation of that shelter.

Homeless Persons Involvement – To the maximum extent practicable, the recipient will involve, through employment, volunteer services, or otherwise, homeless individuals and families in constructing, renovating, maintaining, and operating facilities assisted under the ESG program, in providing services assisted under the ESG program, and in providing services for occupants of facilities assisted under the program.

Consolidated Plan – All activities the recipient undertakes with assistance under ESG are consistent with its consolidated plan.

Discharge Policy – The recipient will establish and implement, to the maximum extent practicable and where appropriate, policies and protocols for the discharge of persons from publicly funded institutions or systems of care (such as health care facilities, mental health facilities, foster care or other youth facilities, or correction programs and institutions) in order to prevent this discharge from immediately resulting in homelessness for these persons.

Signature of Authorized Official

Date

Title

Housing Opportunities for Persons With AIDS Certifications

The HOPWA grantee certifies that:

Activities -- Activities funded under the program will meet urgent needs that are not being met by available public and private sources.

Building -- Any building or structure assisted under that program shall be operated for the purpose specified in the consolidated plan:

1. For a period of not less than 10 years in the case of assistance involving new construction, substantial rehabilitation, or acquisition of a facility,

2. For a period of not less than 3 years in the case of assistance involving non-substantial rehabilitation or repair of a building or structure.

_____ _____

Signature of Authorized Official Date

_____

Title

APPENDIX TO CERTIFICATIONS

INSTRUCTIONS CONCERNING LOBBYING CERTIFICATION:

Lobbying Certification

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-7000

ASSISTANT SECRETARY FOR
COMMUNITY PLANNING AND DEVELOPMENT

April 10, 2026

Ms. Heather Graham
Mayor of Pueblo
1 City Hall Pl
Pueblo, CO 81003

Dear Mayor Graham,

Secretary Scott Turner is committed to improving housing opportunities, reducing regulations to lower housing cost, and expanding housing supply for hardworking Americans. The nationwide shortage of rental and owner-occupied properties and the current rate of construction have not kept pace with the demand. This lack of adequate housing supply leads to higher prices for renters and homebuyers alike, forcing some into homelessness and preventing countless Americans from becoming homeowners. Across the country, partnerships between public and private sectors are providing millions of Americans an opportunity to get ahead. HUD is determined to continue its collaboration with you so programs are responsibly utilized and can spark additional leveraging and partnerships to address the nation's housing challenges.

As authorized by the Consolidated Appropriations Act (Public Law 119-75) on February 3, 2026, I am honored and excited to announce that the Pueblo jurisdiction is receiving the following Fiscal Year 2026 allocations for the identified programs:

Community Development Block Grant (CDBG) $1,433,918.00

HOME Investment Partnerships Program (HOME) $773,865.49

Emergency Solutions Grants (ESG) $ 0.00

Housing Opportunities for Persons With AIDS (HOPWA) $ 0.00

Recovery Housing Program (RHP) $ 0.00

In addition, your jurisdiction's CDBG allocation for this year provides you with $7,169,590.00 in available Section 108 loan guarantee borrowing authority. Section 108 permits you to borrow up to five times of your current CDBG allocation. This loan allows jurisdictions to maximize access to low-interest capital, and provide long-term financing to invest in Opportunity Zones, or further address gap financing for big projects that you envision for your community.

As you are finalizing your Annual Action Plans or Consolidated Plans that are due for submission to our office by August 16, 2026, please be reminded that it is important to align with

applicable laws and executive orders. If you or any member of your staff have questions, please do not hesitate to contact your local HUD Field Office or CPDGDAS@hud.gov.

Thank you for your interest in CPD programs and for ensuring that these dollars are responsibly achieving outcomes as intended by law. When people have a safe and stable place to call home, they can focus on contributing to the economy and be productive members of their respective communities.

Sincerely,



Ronald J. Kurtz
Assistant Secretary
for Community Planning and Development

CITY OF PUEBLO – COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)
Program Summary & Recommended Funding Amount
CD2602 – Supportive Services | Posada

Organization Information
Agency Name: Posada
Primary Address: 501 Belmont Ave., Pueblo, CO 81004
Mailing Address: 827 E. 4th Street, Pueblo, CO 81001
Contact: Lili Avalos | 719-545-8776 ext. 5 | Lili.Avalos@posadapueblo.org
Year Incorporated: 1987 | 501(c)(3) Nonprofit |

Organizational Mission
Posada provides shelter, housing, and comprehensive supportive services to homeless, at-risk, and low-income individuals and families in Pueblo County. Their mission is to meet immediate needs while helping clients overcome the barriers that contribute to homelessness. Posada also serves as a Community Housing Development Organization (CHDO), creating affordable housing within the City and County of Pueblo.

Program Overview: Supportive Services for the Homeless

Posada requests CDBG funding to support the delivery of emergency shelter, housing support, and wraparound services for homeless families, veterans, seniors, and individuals at risk of homelessness. Services include:

- Intensive case management
- Basic needs assistance
- Emergency, transitional, and permanent housing support
- Referrals for medical, mental health, behavioral health, and employment services
- Application assistance for mainstream benefits and community resources

Services are primarily delivered at 501 Belmont, with additional outreach via phone, email, and off-site engagement as needed. The program collaborates extensively with the Continuum of Care, Coordinated Entry, Veterans Council, local governments, and other community partners to ensure services are coordinated and not duplicated.

The need for services continues to grow due to the ongoing impacts of the economy, affordable-housing shortages, and lingering effects of the pandemic.

Target Population

• Homeless individuals and families within the City of Pueblo
• 44% children under 18
• 10% seniors over 55
• 23% report a disability
• 11% have a mental-health diagnosis

The majority served are families with children.

Projected Outcomes (2026 Program Year)

Posada aims to serve at least 750 unduplicated individuals through its Supportive Services Program. Expected outcomes include:

• Improved housing stability and retention
• Rapid connection to shelter or housing resources
• Increased access to medical, mental-health, behavioral-health, education, and employment services
• Enhanced self-sufficiency through case management and resource navigation

Referrals will support access to life-skills classes, benefits enrollment, and mainstream services. Posada emphasizes that stable housing allows individuals to focus on health, employment, and long-term stability—yielding cost savings for the broader community.

CDBG National Objective

This program qualifies under the Low/Moderate Income National Objective and serves special-needs populations including homeless families, seniors, individuals with disabilities, and those at risk of homelessness.

Funding Summary

Original Request: **$100,000**
Recommended Funding Amount: $95,195

Funding will directly support staffing, case management, resource coordination, and service delivery that stabilizes vulnerable households and reduces long-term community costs related to homelessness.

CITY OF PUEBLO – COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)
Program Summary & Recommended Funding Amount
CD2603 – Housing Stabilization | Catholic Charities of Southern Colorado

Organization Information
Agency Name: Catholic Charities of the Diocese of Pueblo (Catholic Charities of Southern Colorado)
Primary Address: 429 W. 10th St., Pueblo, CO 81003
Contact: Anu Keiley | 719-586-8624 | kkeiley@ccsoco.org
Mailing Address: 429 W. 10th St., Pueblo, CO 81003
Year Incorporated: 1944 | 501(c)(3) Nonprofit |

Organizational Mission
Catholic Charities of Southern Colorado empowers individuals and families to live whole, healthy lives by strengthening protective factors, building skills, and increasing opportunities. Serving Pueblo County since 1944, Catholic Charities operates as a Family Resource Center offering interconnected programs in Prevention & Stability, Family Strengthening, and Opportunity Building. More than 90% of clients live below the federal poverty level, and programs emphasize education, financial stability, self-reliance, and long-term wellness.

Program Overview: Stabilizing Housing for Pueblo's Families

Catholic Charities requests CDBG funding to support its long-standing Home Stability Program, operating since 1967. This initiative stabilizes vulnerable households by providing:

- Emergency rent, mortgage, and utility assistance
- Representative Payee services for Social Security/SSDI recipients
- Budgeting support, goal-setting, and financial planning
- Debt management and creditor negotiation
- Referral to NeighborWorks Southern Colorado for structured housing and financial counseling

The program serves clients who are at high risk of homelessness due to disabilities, financial instability, poor support systems, or fixed incomes. Staff include an Emergency Assistance Specialist, two Home Stability Representatives, and a Program Coordinator.

Services are delivered in person at 429 W. 10th St., by phone, and electronically. Bilingual assistance is available.

Target Population

• Pueblo residents at risk of homelessness
• Individuals receiving SSI/SSDI (approximately 300 managed through Representative Payee services)
• Households with extremely low to low incomes
• Households experiencing disabilities, limited incomes, or financial emergencies
• Many female-headed households and larger families (4+ individuals)

All Census Tracts may be represented.

Projected Outcomes (2026 Program Year)

Catholic Charities will measure outcomes through action plans, case notes, and financial records maintained in Salesforce.

Outcome 1: Emergency Assistance
• At least 750 clients will receive utility and/or water assistance.
• Desired outcome: 75% will report improved housing security following assistance.

Outcome 2: Representative Payee Services
• At least 175 Pueblo residents receiving SSI/SSDI will receive payee support.
• Desired outcome: 90% will remain housed for at least 90 days.

These services reduce the likelihood of homelessness by stabilizing finances, reducing debt, and supporting consistent payments to landlords and creditors.

CDBG National Objective

This program meets the Low/Moderate Income National Objective and serves special-needs populations including residents with disabilities, low-income households, and those vulnerable to homelessness.

Funding Summary

Original Request: **$25,000**
Recommended Funding Amount: $25,000

Funding will support a portion of the Home Stability Program Coordinator position, enabling Catholic Charities to continue delivering housing stabilization, financial management, and emergency assistance services for Pueblo families.

CITY OF PUEBLO – COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)
Program Summary & Recommended Funding Amount
CD2603 – Charity Works | Catholic Charities of Southern Colorado

Organization Information
Agency Name: Catholic Charities of the Diocese of Pueblo (Catholic Charities of Southern Colorado)
Primary Address: 429 W. 10th St., Pueblo, CO 81003
Contact: Anu Keiley | 719-586-8624 | kkeiley@ccsoco.org
Mailing Address: 429 W. 10th St., Pueblo, CO 81003
Year Incorporated: 1944 | 501(c)(3) Nonprofit |

Organizational Mission
Catholic Charities of Southern Colorado empowers individuals and families to live whole, healthy lives by strengthening protective factors, building skills, and increasing opportunities. Serving Pueblo County since 1944, Catholic Charities operates as a Family Resource Center offering interconnected programs in Prevention & Stability, Family Strengthening, and Opportunity Building. More than 90% of clients live below the federal poverty level, and programs emphasize education, financial stability, self-reliance, and long-term wellness.

Program Overview: Charity Works

The Charity Works program is a workforce-readiness and employment-support initiative serving individuals experiencing homelessness in Pueblo. Launched in partnership with the City of Pueblo in 2024, the program uses a low-barrier volunteer service model to engage participants in dignified day-labor work, combined with wraparound case management to address housing, employment, and stability needs.

Program components include:

• Outreach and recruitment at community hubs
• Volunteer day-labor work crews performing city beautification projects
• $50/day stipends for volunteer work plus meals and transportation
• Transition opportunities to subsidized employment lasting up to 12 weeks
• Comprehensive workforce readiness services (resumes, job search, documentation, applications)
• Referrals and access to supportive services such as hygiene, clothing, housing navigation, and benefits enrollment
• 90-day follow-up for participants securing unsubsidized employment

Catholic Charities leverages extensive partnerships with the City of Pueblo and approximately 20 local employers to create pathways to transitional and full-time jobs.

Target Population

• Individuals experiencing homelessness across all City of Pueblo census tracts
• Participants with limited employment histories, lacking documentation, or facing multiple barriers
• Unhoused individuals seeking job readiness, stability services, or transitional employment
• People referred through community partners such as Soup Kitchen, Cooperative Care Center, Project Apollo, and others

The program expects to engage up to 50 individuals in a program year.

Projected Outcomes (2026 Program Year)

Catholic Charities will measure progress through attendance logs, case notes, payroll records, and volunteer time-tracking systems.

Objective 1: Volunteer & Employment Participation
• 50 participants engaged in volunteer and/or subsidized employment.
• Outcome 1: 30 participants complete at least 2,000 hours of volunteer beautification work.
• Outcome 2: 10 participants receive subsidized wage opportunities.
• Outcome 3: 6 participants secure unsubsidized employment.
• Outcome 4: 4 participants retain employment for 90 days.

Objective 2: Supportive Services & Stability
• 50 participants receive supportive services based on individualized needs assessments.
• Outcome 1: At least 25 participants receive on-site enrollment assistance for Medicaid, SNAP, or VA benefits.
• Outcome 2: At least 40 participants receive services reducing employment barriers (housing navigation, transport, hygiene items, clothing, etc.).

The program builds confidence, restores a sense of purpose, and strengthens pathways to long-term economic independence.

CDBG National Objective

This project meets the Low/Moderate Income National Objective and serves special-needs populations experiencing homelessness.

Funding Summary

Original Request: **$35,000**
Recommended Funding Amount: $35,000

Funds will support personnel delivering outreach, volunteer coordination, job readiness training, and wraparound services that prepare individuals experiencing homelessness for stable employment and long-term self-sufficiency.

CITY OF PUEBLO – COMMUNITY DEVELOPMENT BLOCK GRANT (CDBG)
Program Summary & Recommended Funding Amount
CD2605 – Senior Transportation | Senior Resource Development Agency (SRDA)

Organization Information
Agency Name: Senior Resource Development Agency, Pueblo, Inc. (SRDA)
Primary Address: 230 N. Union Ave., Pueblo, CO 81003
Contact: George E. Chintala | 719-553-3439 | george@srda.org
Mailing Address: 230 N. Union Ave., Pueblo, CO 81003
Year Incorporated: 1971 | 501(c)(3) Nonprofit |

to remain in their homes safely while reducing institutional care costs and increasing access to supportive services.

Program Overview: SRDA Senior Transportation Program

SRDA's Transportation Program provides on-demand, curb-to-curb rides for seniors age 60+ across the City of Pueblo and surrounding communities. Services enable seniors to access:

- Medical appointments
- Dialysis and wound care treatments
- Adult day programs
- Nutrition sites
- Essential errands and quality-of-life needs

Rides operate Monday–Friday, with expanded hours for rural areas. This service is crucial for seniors with limited mobility, limited income, or disabilities. No senior is denied service due to inability to pay.

In 2024, SRDA provided 29,462 one-way trips to 707 unduplicated clients, including 13,793 trips (47%) for seniors living in the City of Pueblo.

Fund Leveraging

SRDA will use CDBG funding to leverage an 80% funding commitment from the Colorado Department of Transportation (CDOT) for the purchase of two (2) new wheelchair-equipped 12-passenger vehicles.

- Total Vehicle Cost: $299,460
- CDOT Share (80%): $239,568
- **CDBG Local Match (20%): $59,892**

These vehicles are essential due to rising costs and an aging fleet. Nearly half of SRDA's 20-vehicle fleet has 150,000–260,000 miles, making replacement critical for safety, reliability, and cost-efficient maintenance.

Target Population

- Seniors age 60+ residing in the City of Pueblo
- Seniors with mobility limitations, disabilities, or low incomes
- Residents in low- to moderate-income Census Block Groups

Projected Outcomes (2026 Program Year)

SRDA will use transportation software and survey tools to track outcomes including:

- Number of one-way trips provided
- Number of unduplicated seniors served
- Client demographics (age, gender, ethnicity, zip codes)
- Satisfaction surveys documenting ride quality and safety

Expected outcomes include:

- Thousands of safe, reliable one-way trips for Pueblo seniors
- Reduced isolation and increased independence
- Continued access to medical care, dialysis, and life-sustaining treatments
- Lower community healthcare costs by supporting preventative care and aging-in-place

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CDBG National Objective

This program meets the Low/Moderate Income National Objective and serves special-needs populations including elderly and disabled residents.

Funding Summary

Original Request: **$59,892**
Recommended Funding Amount: $59,892

Funding provides the required 20% match toward the purchase of two CDOT-funded vehicles, allowing SRDA to maintain and expand safe, reliable transportation vital to senior independence and community health.

AGREEMENT FOR COMMUNITY DEVELOPMENT SERVICES
(Subrecipient Agreement)
(Non-profit entity)

THIS AGREEMENT ("Agreement") is made and entered into this DATE, by and between the City of Pueblo, a Municipal Corporation, hereinafter referred to as the "City" and **AGENCY NAME, a nonprofit entity**, with an address of **ADDRESS NAME**, hereinafter referred to as the "Subrecipient" for **ACTIVITY NAME**

WHEREAS, the City has entered grant agreements with the U.S. Department of Housing and Urban Development ("HUD") whereby federal financial assistance may be made available to the City under Title I of the Housing and Community Development Act of 1974, as amended to date; and

WHEREAS, pursuant to such grant agreements the City is undertaking certain activities necessary for the execution of a project situated in the project area described in the Scope of Services; and

WHEREAS, the City desires to disburse funds to the Subrecipient to execute certain projects and/or perform certain services in connection with such undertaking of the City; and

WHEREAS, Subrecipient has represented to the City that is duly qualified, eligible and willing to undertake certain projects and/or services identified herein and in the Scope of Services attached hereto.

NOW, THEREFORE, in consideration of the foregoing recitals and the terms and conditions set forth herein, the parties hereto do mutually agree as follows:

1. SCOPE OF SERVICES; RESPONSIBILITIES OF SUBRECIPIENT

(a) Subrecipient agrees to satisfactorily perform and complete all services and items of work, and furnish all labor and materials encompassed within or reasonably necessary to accomplish the tasks and functions described in the Scope of Services attached hereto as Exhibit "A" and incorporated herein by reference, in full compliance with all provisions of this Agreement.

(b) Subrecipient warrants and represents that it: (i) has the requisite authority and capacity to perform all terms and conditions on Subrecipient's part to be performed hereunder; (ii) that it is duly organized as a non-profit organization under state law and is in good standing with the Secretary of State of Colorado; (iii) that it is fully aware of and understands its duty to perform all functions and services in accordance with the regulatory requirements of 24 CFR Part 570 and those identified in Exhibit "C" hereto; and (iv) that it is accepting federal financial assistance hereunder subject to certain mandatory repayment provisions.

2. RESPONSIBILITIES OF THE CITY

The City shall designate a representative of the City who will be authorized to make all necessary decisions required of the City on behalf of the City in connection with the performance of this Agreement and the disbursement of funds in connection with the program. In the absence of such a designation, the Mayor shall be deemed as City's authorized representative.

3. SUBRECIPIENT'S COMPENSATION AND METHOD OF PAYMENT

(a) The City will pay to Subrecipient an amount up to that specified in subparagraph (c) of this paragraph as full compensation for all services and work to be performed or undertaken by Subrecipient under this Agreement. Payment of funds to Subrecipient is subject to all of the following requirements, which shall be conditions precedent to payment: (i) that Subrecipient has expended funds for eligible approved expenditures, (ii) that Subrecipient is not in default of any material provision of this Agreement nor applicable law or regulation, (iii) that Subrecipient has timely submitted requests for payment or reimbursement detailing the eligible payment or reimbursement items in a format approved by City, (iv) that Subrecipient has certified with each payment or reimbursement request compliance with the requirements identified in Exhibit "C" and that all expenditures for which reimbursement is sought were made for and in furtherance of an approved project and are an eligible use of federal assistance under the Act and federal regulations, and (v) that City has timely received from HUD sufficient federal assistance under the Act to make the payment or reimbursement hereunder.

(b) Payment hereunder is also subject to and may only be disbursed in accordance with applicable HUD regulations including but not limited to those at 24 CFR Part 570, as presently promulgated and as same may be revised from time to time in the future, all other terms of this Agreement, and any special provisions in the Scope of Services. All payments received by Subrecipient hereunder are subject to repayment by Subrecipient as provided in 24 CFR Part 570.

(c) The aggregate of all payments made hereunder shall not exceed **$XXXX**

(d) Upon expiration of the term of this Agreement or upon any prior termination, Subrecipient shall transfer to City any funds provided hereunder which are on hand at the time of expiration or termination together with any accounts receivable attributable to the use of funds provided hereunder.

4. TERM OF AGREEMENT

The term of this Agreement shall be from **September 1, 2025,** to **August 31, 2026**, unless sooner terminated as herein provided.

5. TERMINATION OF AGREEMENT

(a) For Cause: This Agreement may be terminated by City for cause, including any nonperformance by the Subrecipient, upon ten (10) days written notice to Subrecipient including a statement of the reasons therefore, and after an opportunity for a hearing has been afforded. If a hearing is requested, it shall be held before the City's Director of Housing and Citizen Services whose decision shall be final. The determination of the City as to the cause of termination and the appropriateness thereof shall be final and binding upon both City and Subrecipient. In accordance with 24 CFR Part 570, cause for termination shall include any material failure by Subrecipient to comply with any term of this Agreement.

(b) For Convenience: This Agreement may be terminated for convenience in accordance with the provisions of 24 CFR Part 570. This Agreement shall automatically terminate at the end of its term as well as in the event of any suspension, reduction or non-receipt of Community Development funds by City.

(c) Post Termination Procedures: In the event of termination, all property acquired by Subrecipient with grant funds, all grant funds, program income, and loans originated with grant funds or by payments therefrom and payments received under such mortgage loans held, owned or retained by the Subrecipient shall immediately become the sole and separate property of the City and the Subrecipient shall perform all acts and execute all instruments necessary to transfer and assign such property, funds, income, and mortgage loans to City. Everything finished or unfinished, documents, data, studies, reports, and work product prepared by the Sub recipient under this Agreement or with grant funds shall, at the option of the

City, become City's property and the Subrecipient shall be entitled to receive just and equitable compensation only for satisfactory work completed for which compensation has not previously been paid nor reimbursement made.

6. ASSIGNABILITY

This Agreement shall not be assigned or transferred by the Subrecipient without the prior written consent of the City. Any assignment or attempted assignment made in violation of this provision shall, at City's election, be deemed void and of no effect whatsoever.

7. CONFLICT OF INTEREST

The Subrecipient certifies and warrants that neither it nor any members of its Boards of Directors, officers or employees has or will derive any personal or financial interest or benefit from the activity or activities assisted pursuant to this Agreement, nor has an interest in any contract, subcontract or agreement with respect thereunto, nor the proceeds thereunder, either for themselves or for those with whom they have family or business ties, during their tenure and for one year thereafter. Subrecipient shall avoid all conflicts of interest which are prohibited by applicable federal regulations including but not limited to those set forth in 24 CFR Part 570 as presently promulgated and as same may be revised from time to time in the future.

8. SUBRECIPIENT RECORDS

Subrecipient shall maintain records as to all services provided, reimbursable expenses incurred in performing the Scope of Services and complete accounting records. Accounting records shall be kept on a generally recognized accounting basis and as requested by the City's auditor. The Subrecipient agrees to comply with all applicable uniform administrative requirements described or referenced in 24 CFR 570.502. The Compliance Provisions attached as Exhibit "B" hereto are made a part of this Agreement and Subrecipient agrees to perform and comply with same. The City, HUD, Comptroller General of the United States, the Inspector General of HUD and any of their authorized representatives, shall have the right to inspect and copy, during reasonable business hours, all books, documents, papers and records of the Subrecipient which relate to this Agreement for making an audit or examination. Upon completion of the work and end of the term of this Agreement, the City may require all Subrecipient's financial records relating to this Agreement to be turned over to City.

9. MONITORING AND EVALUATION

The City shall have the right to monitor and evaluate the progress and performance of the Subrecipient to assure that the terms of this Agreement are being satisfactorily fulfilled in accordance with HUD's, City's and other applicable monitoring and evaluation criteria and standards. The City shall at least quarterly review the Subrecipient's performance using on-site visits, progress reports required to be submitted by the Subrecipient, audit findings, disbursements transactions and contact with the Subrecipient as necessary. The Subrecipient shall furnish to the City monthly or quarterly program and financial reports of its activities in such form and manner as may be requested by the City. Subrecipients shall fully cooperate with City relating to such monitoring and evaluation.

10. SUBRECIPIENT FILES AND INFORMATION REPORTS

The Subrecipient shall maintain files containing information which shall clearly document all activities performed in conjunction with this Agreement, including, but not limited to, financial transactions, conformance with assurances, activity reports, and program income. These records shall be retained by the Subrecipient for a period of three years after the completion of the project. Activity reports shall be submitted monthly or quarterly no later than the fifteenth day of the month following the end of month or quarter for which the report is submitted, and no later than the following dates:

1. **First Quarter:** **December 15, 2025**
2. **Second Quarter:** **March 15, 2026**
3. **Third Quarter:** **June 15, 2026**
4. **Fourth Quarter:** **September 15, 2026**
5. **Annual Report:** **September 15, 2026**

11. INDEPENDENCE OF SUBRECIPIENT

Nothing herein contained nor the relationship of Subrecipient to City, which relationship is expressly declared to be that of an independent contractor, shall make or be construed to make Subrecipient or any of Subrecipient's agents or employees the agents or employees of the City. Subrecipient shall be solely and entirely responsible for its acts and the acts of its agents, employees and subcontractors.

12. LIABILITY, INSURANCE

(a) As to the City, Subrecipient agrees to assume the risk of all personal injury, including death and bodily injury, and damage to and destruction of property, including loss of use therefrom, caused by or sustained, in whole or in part, in conjunction with or arising out of the performance or nonperformance of this Agreement by Subrecipient or by the conditions created thereby. Subrecipient further agrees to indemnify, defend, and save harmless the City, its officers, agents and employees, from and against all claims, liabilities, costs expenses, penalties and attorney fees arising from such injuries to persons or damages to property or based upon or arising out of the performance or nonperformance of this Agreement by Subrecipient or out of any violation by Subrecipient of any statue, ordinance, rule or regulation.

(b) Subrecipient agrees that it shall procure and will maintain during the term of this Agreement, such insurance as will protect it from claims under workers' compensation acts, claims for damages because of personal injury including bodily injury, sickness or disease or death of any of its employees or of any person other than its employees, and from claims or damages because of injury to or destruction of property including loss of use resulting therefrom; and such insurance will provide for coverage in such amounts as set forth in subparagraph (c).

(c) The minimum insurance coverage which Subrecipient shall obtain and keep in force is as follows:

(i) Workers' Compensation Insurance complying with statutory requirements in Colorado.

(ii) Comprehensive General and Automobile Liability Insurance with limits not less than Six Hundred Thousand and No/100 Dollars ($600,000) per person and occurrence for personal injury, including but not limited to death and bodily injury, and Six Hundred Thousand and No/100 Dollars ($600,000) per occurrence for property damage.

(d) In the event Subrecipient's obligations under this Agreement are secured by a deed of trust or mortgage instrument as provided in paragraph 14 (c) of this Agreement, Subrecipient agrees to procure and maintain, at its own expense, hazard and fire insurance upon the property described in said deed of trust on an all-risk form in such amounts of all liens against the property and the amount of funds provided by City pursuant to this Agreement. Subrecipient shall furnish a certificate of insurance certifying such coverage to City's Director of Finance prior to disbursement of any funds to Subrecipient. Both said certificate of insurance and the policy procured by Subrecipient shall name the City as an additional insured and loss payee.

13. CERTIFICATIONS

The Subrecipient agrees to execute and abide by the certifications contained in Exhibit "C" hereto, which are hereby made a part of this Agreement. Subrecipient will have any contractors or subcontractors agree to execute and abide by the certifications contained in Exhibit "C" to this Agreement.

14. PROGRAM INCOME; REVERSION OF ASSETS

(a) Unless otherwise authorized by City in writing, all program income shall be returned to City within 30 days of receipt by Subrecipient. In the event City authorizes Subrecipient to retain any portion of program income, it shall only be used to accomplish the work set forth in the Scope of Services, and the amount of grant funds payable by City to Subrecipient shall be adjusted as provided by 24 CFR 570.504(b)(2)(i) and (ii).

(b) Upon expiration of the term of this Agreement, or upon any prior termination, Subrecipient shall transfer to City any funds provided hereunder which are on hand at the time of expiration or termination together with any accounts receivable attributable to the use of funds provided hereunder.

(c) Any real property under Subrecipient's control that was acquired or improved in whole or in part with funds provided pursuant to this Agreement in excess of U.S. $25,000 shall either: (i) be used to meet one of the national objectives set forth in 24 CFR 570.208 until five years after expiration or termination of this Agreement, or (ii) not be used in accordance with subparagraph (c)(i), in which event Subrecipient shall pay to City an amount equal to the current market value of the property less any portion of the value attributable to expenditures of funds not provided under this Agreement for the acquisition of, or improvement to the property. The use restriction and repayment obligation set forth in this subparagraph shall survive termination or expiration of this Agreement and shall be fully enforceable and subject to collection by City or HUD in accordance with applicable laws. If requested by City, Subrecipient shall execute a deed of trust or mortgage instrument which shall be and constitute a lien upon all real property acquired or improved with funds provided hereunder, and which shall secure all obligations of Subrecipient hereunder.

(d) In the event City incurs any costs or expenses in enforcing the requirements of this paragraph 14 or in bringing any action to recover the property or amount of any repayment obligation, City shall be entitled to recover its costs and expenses, including reasonable attorneys' fees.

15. SPECIAL REQUIREMENTS APPLICABLE TO IMPROVEMENTS TO PROPERTY

(a) In addition to all procurement requirements otherwise applicable to Subrecipient pursuant to any other provision of this Agreement or pursuant to any requirement of law or regulation incorporated in this Agreement by reference, if any portion of the funds provided to Subrecipient under this Agreement is to be used for making improvements to real property, including new construction, rehabilitation, or remodeling, then in such event Subrecipient shall comply with all requirements of this Paragraph 15.

(b) No improvements shall be undertaken to real property with funds (or reimbursement) provided hereunder unless and until: (i) plans and specifications therefore have been prepared by a registered Professional Engineer in good standing and duly licensed to practice in the State of Colorado or an Architect duly licensed and authorized to conduct a practice of architecture in the state of Colorado; (ii) such plans and specifications have been filed with the City and approved by both the City's designated representative and the City's Director of Public Works; and (iii) all construction contracts for improvements for which payment is sought from City shall have been awarded only after an open, competitive bidding process which has been approved by City's Director of Purchasing and which allows qualified contractors to reasonable participate in the competitive bidding procedures.

(c) If this Paragraph 15 is applicable, no disbursement of funds to Subrecipient shall be made by City hereunder unless and until all conditions precedent to payment specified elsewhere in this Agreement have been satisfied and Subrecipient files with City's Director of Housing and Citizen Services a written request for payment signed by an officer of Subrecipient that certifies: (i) that the amounts included in the request for payment have not been included in any prior request for payment, and (ii) that the improvements listed therein for which payment is sought have been completed in accordance with the approved plans and specifications therefore.

(d) In every contract for construction of improvements for which payment or reimbursement from City is to be provided under this Agreement, Subrecipient shall include a contract clause or clauses, approved by City's Director of Purchasing, requiring the contractor, and all of the contractor's subcontractors of all tiers, to comply with the requirements of the Davis-Bacon Act and implementing regulations, and to pay all laborers and mechanics engaged in work upon the improvements at the prevailing wage rates for such work as determined by the U.S. Department of Labor.

16. RECOGNITION OF HUD, CITY

In all printed materials, project descriptions and other activities undertaken with funds provided under this Agreement, Subrecipient shall provide recognition that funds have been provided by U.S. Department of Housing and Urban Development and the City of Pueblo. Recognition shall be accomplished by prominent disclosure of the role of HUD and City in all such printed materials and project signage, if any.

17. PERA LIABILITY

The Subrecipient shall reimburse the City for the full amount of any employer contribution required to be paid by the City of Pueblo to the Public Employees' Retirement Association ("PERA") for salary or other compensation paid to a PERA retiree performing contracted services for the city under this Agreement. The Subrecipient shall fill out the questionnaire attached as Exhibit "D" and submit the completed form to Finance Office as part of the signed Agreement.

18. ENTIRE AGREEMENT; AMENDMENTS

The provisions set forth in this Agreement, and all Exhibits and attachments to this Agreement, constitute the entire and complete agreement of the parties hereto and supersede all prior written and oral agreements, understandings or representations related thereto. No amendment or modification of this Agreement, and no waiver of any provisions of this Agreement shall be binding unless made in writing and executed by the duly authorized officers of both the Subrecipient and City.

19. GOVERNING LAW AND VENUE

This Agreement shall be governed by the laws of the State of Colorado. Venue for any action arising under this Agreement or for the enforcement of this Agreement shall be in a state court with jurisdiction located in Pueblo County, Colorado.

20. AUTHORITY FOR SIGNATURES; ELECTRONIC SIGNATURES

(a) The persons signing this Agreement on behalf of Subrecipient represent and warrant that such persons and Subrecipient have the requisite power and authority to enter, execute and deliver this Agreement and that this Agreement is a valid and legally binding obligation of Subrecipient enforceable against Subrecipient in accordance with its terms.

(b) This Agreement and all other documents contemplated hereunder may be executed using electronic signatures with delivery via facsimile transmission, by scanning and transmission of electronic files in Portable Document Format (PDF) or other readily available file format, or by copy transmitted via email, or by other electronic means and in one or more counterparts, each of which shall be: (i) an original, and all of which taken together shall constitute one and the same agreement, (ii) a valid and binding agreement and fully admissible under state and federal law, and (iii) enforceable in accordance with its terms.

21. FUND AVAILABILITY; SUBJECT TO LAW

(a) Financial obligations of City, if any, after the current year in which this Agreement is signed by both parties are contingent upon funds for that purpose being appropriated, budgeted and otherwise made available by HUD, Pueblo City Council and City executive departments. Nothing herein shall be deemed to create an ongoing financial obligation of City.

(b) This Agreement is expressly made subject to the limitations of the Colorado Constitution. Nothing herein shall constitute, nor be deemed to constitute, the creation of a debt or multi-year fiscal obligation or an obligation of future appropriations by the City Council of Pueblo, contrary to Article X, §20 of the Colorado Constitution or any other constitutional, statutory or charter debt limitation. Notwithstanding any other provision of this Agreement, with respect to any financial obligation of City which may arise under this Agreement in any fiscal year, in the event the budget or other means of appropriations for any such year fails to provide funds in sufficient amounts to discharge such obligation, such failure shall not constitute a default by or breach of this Agreement, including any sub-agreement, attachment, schedule or exhibit thereto, by the City. City may in its sole and absolute discretion terminate this Agreement for reasons of non-appropriation immediately upon written notice without causing default or breach.

(c) Nothing in this Agreement is intended, nor should it be construed, to create or extend any rights, claims or benefits or assume any liability for or on behalf of any third party, or to waive any immunities or limitations otherwise conferred upon the City of Pueblo, a Municipal Corporation under or by virtue of federal or state law, including but not limited to the Colorado Governmental Immunity Act, C.R.S. §24-10-101, et seq.

IN WITNESS, WHEREOF, the Subrecipient and the City have executed this Agreement as of the date first above written and under the laws of the State of Colorado.

ATTEST:

CITY OF PUEBLO,
A MUNICIPAL CORPORATION

_____
City Clerk

By_____
Heather Graham, Mayor

[S E A L]

SUBRECIPIENT:

ATTEST:

By_____
Signature

By_____
Signature

Name_____

Name_____

Title_____

Title_____

EXHIBIT A
SCOPE OF SERVICES

A. Principal Tasks

The Subrecipient will be responsible for administering a CDBG Year <<Program Year>>, <<Project ID>>, <<Brief Project Description>>. The Subrecipient will administer all tasks for the aforesaid program in compliance with all applicable federal, state and local rules and regulations governing these funds and, in a manner, satisfactory to the City.

The major goal of the Subrecipient's efforts under this Agreement will be as follows:

1. <<Brief Project Description>>
2. Subrecipient commits to the Goals, Outcomes and Units of Service outlined in its CDBG application.

Changes in the scope of services, budget, or method of compensation contained in this Agreement, unless otherwise noted may only be made through a written amendment to this Agreement, executed by the Subrecipient and City.

Subrecipient will submit at a minimum, quarterly reports that address the Subrecipient's ability to meet the goals and outcomes as submitted with the initial application.

B. Budget and Method of Compensation

The Subrecipient will submit reimbursement requests for services rendered, operating expenditures and materials purchased supported by original invoices.

Approved budget is as follows:

Operating Costs:		
Eligible Expenses		$XXXX
	Total	$XXXX

C. Performance Monitoring:

The City will monitor the performance of the Subrecipient against goals and performance standards required herein. Substandard performance as determined by the City will be considered non-compliance with this agreement. If actions to correct such substandard performance are not taken by the Subrecipient within a reasonable period of time after being notified by the City contract suspension or termination procedures will be initiated.

D. Time of Performance:

Services shall start on the **September 1, 2025,** and end on the **August 31, 2026**. The term of this agreement and the provisions herein shall be extended to cover any additional time period during which the Subrecipient remains in control of CDBG funds and other assets including program income.

EXHIBIT B
COMPLIANCE PROVISIONS INCORPORATED
IN A CONTRACT FOR SERVICES

1. An accounting system using the accrual basis of generally accepted accounting principles which accurately reflects all costs chargeable (paid and unpaid) to the project should the project terminate the next day is mandatory. A receipts and disbursements ledger must be maintained. A general ledger with an income and expense account for each budgeted line item is necessary. Paid invoices revealing check number, date paid and item are necessary. Paid invoices revealing check number, date paid and evidence of goods or services received are to be filed per the expense account they were charged. The City must review and approve your account system and internal controls prior to the release of funds.

2. There is no flexibility on budgets. Line items may be changed only by the City's written concurrence of a budget amendment.

3. A log listing all long-distance telephone calls must be maintained (showing date, city and agency called, person making call and person called).

4. Eligible expenses are those considered reasonable and necessary costs for the efficient operation of the program as determined by the City. All costs must be budgeted items. Request for advance or reimbursements of expenses must be accompanied by:

1. Original invoice marked with funding source
2. Detailed listing of each expense showing:
    a) recipient
    b) brief description of purchase
    c) amount with method of computation detailed

Cost Summary must be submitted monthly to reflect entries through the closing date for the books (indicate Closing Date on Cost Summary).

5. All employees handling funds are required to be insured by a fidelity bond.

6. The City shall not be obligated to any third parties of the Subrecipient. Each Subrecipient is further cautioned against obligating funds beyond the contract date of the agreement between the City and the Subrecipient. (Example: rent or lease agreements, service contracts, insurance, etc.)

7. The contractor will furnish the City such statements, records, data and information, and permit such interviews with personnel as the City may request to effectively monitor and evaluate the project.

8. City auditors will periodically make interim audits and may, upon completion of the project, make a final audit.

9. All records must be retained by the agency for a period of three years following the last day of each contract. (Cost summary reports must reflect actual general ledger balances.)

10. Subrecipient will have any contractors or subcontractors agree to execute and abide by the certifications contained in Exhibit "C" to this Agreement.

EXHIBIT C
CERTIFICATIONS

Subrecipient hereby certifies that the grant will be conducted and administered in compliance with:

(1) Title VI of the Civil Rights Act of 1964 (Pub. L. 88-352; 42 U.S.C. 2000d, et seq.) and implementing regulations issued at 24 CFR Part 1;

(2) Title VIII of the Civil Rights Act of 1968 (Pub. L. 90-284; 42 U.S.C. 3601, et seq.), as amended; and that the grantee will administer all programs and activities related to housing and community development in a manner to affirmatively further fair housing;

(3) Section 109 of the Housing and Community Development Act of 1974, as amended, and the regulations issued pursuant thereto;

(4) Section 3 of the Housing and Urban Development Act of 1968, as amended;

(5) Executive Order 11246, as amended by Executive Orders 11375 and 12086, and implementing regulations issued at 41 CFR Chapter 60;

(6) Executive Order 11063, as amended by Executive Orders 12259, and implementing regulations at 24 CFR Part 107;

(7) Section 504 of the Rehabilitation Act of 1973 (Pub. L. 93-112), as amended, and implementing regulations when published for effect;

(8) The Age Discrimination Act of 1975 (Pub. L. 94-135), as amended, and implementing regulations when published for effect;

(9) The relocation requirements of Title II and the acquisition requirements of Title III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, and the HUD implementing regulations set forth in 24 CFR Part 42;

(10) Executive Order 11988 relating to the evaluation of flood hazards and Executive Order 11288 relating to the prevention, control and abatement of water pollution;

(11) The flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (Pub. L. 93-234);

(12) The applicable regulations, policies, guidelines and requirements of OMB Circular Nos. A-102, Revised, 24 CFR Part 570, and Subpart J of 24 CFR 570, A-87, A-110, A-122, A-128 and A-133 as they relate to the acceptance and use of federal funds under this federally-assisted program;

(13) The Clean Air Act (42 U.S.C. 7401 et seq.) as amended (particularly section 176 (c) and (d) [42 U.S.C. 7506 (c) and (d)]) and the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.), as amended. Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA);

(14) HUD environmental criteria and standards [24 CFR Part 51, Environmental Criteria and Standards];

(15) The Safe Drinking Water Act of 1974 (42 U.S.C. 201, 300 (f) et seq., and 21 U.S.C. 349) as amended, particularly section 1424 (e) (42 U.S.C. 300 (h)-303 (e));

(16) The Endangered Species Act of 1973 (16 U.S.C. 1531 et. Seq.) as amended, including but not limited to section 7 (16 U.S.C. 1536) thereof;

(17) The Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1272 et seq.) as amended, particularly section 7 (b) and (c) [16 U.S.C. 1278 (b) and (c)];

(18) The Reservoir Salvage Act of 1960 (916 U.S.C. 469 et seq.), particularly section 3 (16 U.S.C. 469a-1), as amended by the Archeological and Historical Preservation Act of 1974;

(19) Flood Disaster Protection Act of 1973 (42 U.S.C. 4001 et seq.) as amended, particularly sections 102(a) and 202(a) [42 U.S.C. 4012a(a) and 4106(a)];

(20) Executive order 11990, Protection of Wetlands, May 24, 1977 (42 FR 26961 et seq.), particularly sections 2 and 5;

(21) It will comply with the Lead-Based Paint Poisoning Prevention requirements of 25 CFR Part 35 issued pursuant to the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821 et seq.);

(22) The National Historic Preservation Act of 1966 (16 U.S.C. 470 et seq.) as amended; particularly section 106 (16 U.S.C. 470f); and

(23) Executive Order 11593, Protection and Enhancement of the Cultural Environment, May 13, 1971 (36 FR 8921 et seq.), particularly section 2(c).

(24) Construction work financed in whole or in part with federal funds is subject to the prevailing wage requirements of the Davis-Bacon Act (29 CFR, Parts 3 and 5), the Copeland Act (29 CFR Part 3), and the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96). When a project meets this applicability requirement, the labor standards provision of the HUD 4010 and the Davis-Bacon Wage Decision issued for the project will be incorporated into this contract document and shall be incorporated into all construction contracts and subcontracts of any tier thereunder.

(25) No CDBG funds may be expended for lobbying purposes and payments from other sources for lobbying must be disclosed (24 CFR Part 87).

(a) No federally appropriated funds have been or will be paid, by or on behalf of subrecipient, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.

(b) If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federal contract, grant, loan, or cooperative agreement, it will complete

and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.

(26) Where asbestos is present in property undergoing rehabilitation, Federal requirements apply regarding worker exposure, abatement procedures and disposal. (CPD-90-44 EPA/OSHA).

(27) When HOME Investment Partnership Act funds are used, the Subrecipient will comply with implementing regulations and requirements under (24 CFR 92).

(28) The contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act.

(29) The contractor and all of its subcontractors acknowledge and will comply with the requirements of 2 C.F.R. § 200.216, including the prohibition on spending federal loan or grant funds to procure or obtain the prohibited equipment, services, or systems covered by the provision.

(30) To the extent consistent with law and in accordance with 2 C.F.R. § 200.322, contractor and all of its subcontractors will to the greatest extent practicable under the contract, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). This requirement must be included in all contracts and purchase orders that contractor may enter into.

(31) Equal Opportunity. During the performance of this contract, the contractor agrees as follows:

(i) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

(ii) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

(iii) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

(iv) The contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(v) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(vi) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
(vii) In the event of the contractor's non-compliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
(viii) The contractor will include the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

(32) Federally Assisted Construction Contracts. During the performance of this contract, the contractor agrees as follows:
(i) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:
Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
(ii) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
(iii) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
(iv) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
(v) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
(vi) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit

access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(vii) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(viii) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

Signature: _____

Subrecipient

EXHIBIT D
COLORADO PUBLIC EMPLOYEES RETIREMENT ASSOCIATION
SUPPLEMENTAL QUESTIONNAIRE TO BE ANSWERED BY
ANY BUSINESS PERFORMING SERVICES FOR THE CITY OF PUEBLO

Pursuant to section 24-51-1101(2), C.R.S., salary or other compensation from the employment, engagement, retention or other use of a person receiving retirement benefits (Retiree) through the Colorado Public Employees Retirement Association (PERA) in an individual capacity or of any entity owned or operated by a PERA Retiree or an affiliated party by the City of Pueblo to perform any service as an employee, contract employee, consultant, independent contractor, or through other arrangements, is subject to employer contributions to PERA by the City of Pueblo. Therefore, as a condition of contracting for services with the City of Pueblo, this document must be completed, signed and returned to the City of Pueblo:

a) Are you, or do you employ or engage in any capacity, including an independent contractor, a PERA Retiree who will perform any services for the City of Pueblo? Yes___, No___.

b) If you answered "yes" to (a) above, please answer the following question: Are you an individual, sole proprietor or partnership, or a business or company owned or operated by a PERA Retiree or an affiliated party? Yes ____, No____.
If you answered "yes" please state which of the above entities best describes your business:
_____

c) If you answered "yes" to both (a) and (b), please provide the name, address and social security number of each such PERA Retiree.

_____	_____
Name	Name
_____	_____
Address	Address
_____	_____
Social Security Number	Social Security Number

(If more than two, please attach a supplemental list)

Failure to accurately complete, sign and return this document to the City of Pueblo may result in your being denied the privilege or doing business with the City of Pueblo.

If you answered "yes" to both (a) and (b), you agree to reimburse the City of Pueblo for any employer contribution required to be paid by the City of Pueblo to PERA for salary or other compensation paid to you as a PERA Retiree or paid to any employee or independent contractor of yours who is a PERA Retiree performing services for the City of Pueblo. You further authorize the City of Pueblo to deduct and withhold all such contributions from any moneys due or payable to you by the City of Pueblo under any current or future contract or other arrangement for services between you and the City of Pueblo.

Signed _____, 20_____.

By: _____

Name: _____

Title: _____

For purposes of responding to question (b) above, an "affiliated party" includes (1) any person who is the named beneficiary or co-beneficiary on the PERA account of the PERA Retiree; (2) any person who is a relative of the PERA Retiree by blood or adoption to and including parents, siblings, half-siblings, children, and grandchildren; (3) any person who is a relative of the PERA Retiree by marriage to and including spouse, spouse's parents, stepparents, stepchildren, stepsiblings, and spouse's siblings; and (4) any person or entity with whom the PERA Retiree has an agreement to share or otherwise profit from the performance of services for the City of Pueblo by the PERA Retiree other than the PERA Retiree's regular salary or compensation.

ADDITIONAL REPORTING REQUIREMENTS
Catholic Charities, Diocese of Pueblo

You must submit the following forms and/or information with your signed contract(s).

A. Board of Directors Roster;
B. Staff Roster;
C. Budget.

You must submit the following forms and information with each request for disbursement of funds.

A. Request for reimbursement form;
B. Copies of canceled checks;
C. Copies of invoices or receipts;
D. Signed payroll sheets;
E. Demographic information of clients served (can be done quarterly);
F. Any other report or information as required by the grantor or federal agency.

Requests for disbursements of CDBG funds will not be processed until all necessary information and forms are complete. Incomplete requests will be returned to the agency.

_____
Executive Director

Executive Summary

AP-05 Executive Summary - 91.200(c), 91.220(b)

1. Introduction

The City of Pueblo (City) is a Community Development Block Grant (CDBG) entitlement jurisdiction and the Participating Jurisdiction (PJ) for the HOME Consortium with Pueblo County. Each year, the City prepares an Annual Action Plan to describe how federal resources will be used to address priority housing and community development needs identified in the Consolidated Plan. The AAP serves as the annual grant application and implementation roadmap and is submitted via HUD's eCon Planning Suite in IDIS.

This PY2026 AAP presents the City's proposed use of CDBG and the Consortium's proposed use of HOME, aligning with HUD's consolidated planning framework and submission timing guidance. Final submission will occur after HUD publishes actual grant amounts; budgets will be proportionally adjusted to remain within statutory caps (e.g., public services and administration).

2. Summarize the objectives and outcomes identified in the Plan

This could be a restatement of items or a table listed elsewhere in the plan or a reference to another location. It may also contain any essential items from the housing and homeless needs assessment, the housing market analysis or the strategic plan.

This could be a restatement of items or a table listed elsewhere in the plan or a reference to another location. It may also contain any essential items from the housing and homeless needs assessment, the housing market analysis or the strategic plan.

- Affordable Housing: Preserve and produce affordable rental and homeownership units; support rehabilitation and limited homebuyer activities; and utilize CHDO set-aside to expand capacity and production.
- Suitable Living Environment: Improve public facilities and infrastructure, including ADA ramps and sidewalks, public park upgrades, removing blighted and dangerous structures to stabilize LMI neighborhoods.
- Public Services: Provide targeted services that prevent homelessness, stabilize households, and support seniors, while remaining within the CDBG 15% public services cap.
- Effective Administration: Conduct eligible planning, management, and compliance activities within statutory and regulatory administrative limits.

3. Evaluation of past performance

This is an evaluation of past performance that helped lead the grantee to choose its goals or projects.

This is an evaluation of past performance that helped lead the grantee to choose its goals or projects.

Pueblo recently submitted its 2024 Consolidated Annual Performance Evaluation and Review (CAPER), which documented strong delivery of benefits to low- and moderate-income households and highlighted effective community collaboration, while also identifying areas where additional investment is needed. The City of Pueblo's Housing and Citizen Services Department recognizes the significant demand for housing rehabilitation and is committed to strategically targeting low- and moderate-income households to help preserve the community's aging housing stock. With the average home in Pueblo now more than 55 years old, substantially older than housing stock across Colorado, these efforts are increasingly critical. This AAP reaffirms the City's dedication to housing preservation and to addressing the rehabilitation needs of Pueblo's residents.

4. Summary of Citizen Participation Process and consultation process

Summary from citizen participation section of plan.

The City uses a variety of methods to ensure citizen participation and engagement: bilingual public notices; citywide posting of draft plans; a Citizens Advisory Committee (CAC) scoring and recommendation process; public hearings; social media interaction, and ongoing interagency coordination with housing/service providers and the Balance of State Continuum of Care. The Program Year 2026 Annual Action Plan replicates this approach, ensuring meaningful opportunity for comment and alignment with HUD citizen participation rules.

5. Summary of public comments

This could be a brief narrative summary or reference an attached document from the Citizen Participation section of the Con Plan.

This could be a brief narrative summary or reference an attached document from the Citizen Participation section of the Con Plan.

During the draft period, the City anticipates receiving comments from residents, service providers, developers, and advocacy groups. Typical themes include support for increased affordable housing production, infrastructure accessibility, and enhanced homeless prevention. All timely, relevant comments will be reviewed and incorporated as appropriate and summarized in the final AAP and public hearing records.

6. Summary of comments or views not accepted and the reasons for not accepting them

Comments inconsistent with federal eligibility, national objectives, environmental/URA constraints, or statutory caps (e.g., requests that would exceed the CDBG public services cap) may not be accepted. The City will document rationale for non-acceptance in the Annual Action Plan record.

7. Summary

This Annual Action Plan advances Pueblo's Consolidated Plan priorities by directing resources to affordable housing production/preservation, ADA and neighborhood improvements, focused public services, and compliant administration. It leverages CHDO participation, maintains overall LMI benefit, and aligns with HUD's eCon structure and submission guidance.

PR-05 Lead & Responsible Agencies - 91.200(b)

1. Agency/entity responsible for preparing/administering the Consolidated Plan

The following are the agencies/entities responsible for preparing the Consolidated Plan and those responsible for administration of each grant program and funding source.

Agency Role	Name	Department/Agency
CDBG Administrator	PUEBLO	Department of Housing and Citizen Services
HOME Administrator	PUEBLO	Department of Housing and Citizen Services

Table 1 – Responsible Agencies

Narrative

Consolidated Plan Public Contact Information

Melissa Cook, Director

City of Pueblo Department of Housing and Citizen Services

(719) 553-2850, housing@pueblo.us

1 City Hall Place, Pueblo, CO 81003

AP-10 Consultation - 91.100, 91.200(b), 91.215(l)

1. Introduction

Provide a concise summary of the jurisdiction's activities to enhance coordination between public and assisted housing providers and private and governmental health, mental health and service agencies (91.215(l)).

Describe coordination with the Continuum of Care and efforts to address the needs of homeless persons (particularly chronically homeless individuals and families, families with children, veterans, and unaccompanied youth) and persons at risk of homelessness.

Describe consultation with the Continuum(s) of Care that serves the jurisdiction's area in determining how to allocate ESG funds, develop performance standards for and evaluate outcomes of projects and activities assisted by ESG funds, and develop funding, policies and procedures for the operation and administration of HMIS

2. Agencies, groups, organizations and others who participated in the process and consultations

1	**Agency/Group/Organization**	POSADA, INC.
	Agency/Group/Organization Type	Services - Housing Services-Elderly Persons Services-Persons with Disabilities Services-homeless
	What section of the Plan was addressed by Consultation?	Homeless Needs - Families with children Homelessness Needs - Veterans Homelessness Needs - Unaccompanied youth Homelessness Strategy
	Briefly describe how the Agency/Group/Organization was consulted. What are the anticipated outcomes of the consultation or areas for improved coordination?	The Division of Housing and Citizen Services consulted with the agency throughout the year during large, coordinated meetings, one-on-one meetings, and while monitoring ongoing projects. The expected outcome was to coordinate funding to enable the agency and other complementing agencies to address the homeless issues within the city.
2	**Agency/Group/Organization**	Pueblo Rescue Mission
	Agency/Group/Organization Type	Services-homeless
	What section of the Plan was addressed by Consultation?	Homeless Needs - Chronically homeless Homelessness Needs - Veterans Homelessness Strategy
	Briefly describe how the Agency/Group/Organization was consulted. What are the anticipated outcomes of the consultation or areas for improved coordination?	The Division of Housing and Citizen Services consulted with the agency throughout the year during large, coordinated meetings, one-on-one meetings, and during monitoring reviews of ongoing projects. The anticipated outcome was coordinating with the agency to serve the homeless community.
3	**Agency/Group/Organization**	SRDA Pueblo, Inc.
	Agency/Group/Organization Type	Services - Housing Services-Elderly Persons

	What section of the Plan was addressed by Consultation?	Non-Homeless Special Needs
	Briefly describe how the Agency/Group/Organization was consulted. What are the anticipated outcomes of the consultation or areas for improved coordination?	The Division of Housing and Citizen Services consulted with the agency one-on-one and during the monitoring review of ongoing projects. The anticipated outcome was the coordination of funding to allow the agency to address issues affecting elderly citizens within the city.
4	**Agency/Group/Organization**	Colorado Legal Services
	Agency/Group/Organization Type	Housing Service-Fair Housing
	What section of the Plan was addressed by Consultation?	Homelessness Strategy Eviction Prevention
	Briefly describe how the Agency/Group/Organization was consulted. What are the anticipated outcomes of the consultation or areas for improved coordination?	The Division of Housing and Citizen Services consulted with the agency for one-on-one consultations and coordinated intergovernmental agency consultations. The goal of the consultation was to coordinate funding and develop wraparound services to keep families housed.
5	**Agency/Group/Organization**	Housing Authority of the City of Pueblo
	Agency/Group/Organization Type	Housing PHA Services - Housing Services-homeless
	What section of the Plan was addressed by Consultation?	Public Housing Needs Homelessness Strategy Housing Development

	Briefly describe how the Agency/Group/Organization was consulted. What are the anticipated outcomes of the consultation or areas for improved coordination?	The Division of Housing and Citizen Services consulted with the agency throughout the year during one-on-one meetings and monitoring reviews of ongoing projects. The anticipated outcome was the production of additional units and the coordination of LIHTC funding. Additionally, the City coordinated with the Authority on grant applications to the EPA and HUD.

Table 2 – Agencies, groups, organizations who participated

Identify any Agency Types not consulted and provide rationale for not consulting

Other local/regional/state/federal planning efforts considered when preparing the Plan

Name of Plan	Lead Organization	How do the goals of your Strategic Plan overlap with the goals of each plan?

Table 3 – Other local / regional / federal planning efforts

Narrative

AP-12 Participation - 91.401, 91.105, 91.200(c)

1. Summary of citizen participation process/Efforts made to broaden citizen participation Summarize citizen participation process and how it impacted goal-setting

The City utilizes a multipronged engagement strategy to ensure CDBG funding is directed to low-income households and neighborhoods. The Department of Housing and Citizen Services participates in a wide range of community groups and committees throughout the year to coordinate funding opportunities, promote available services, and connect residents with the most appropriate resources. The Department actively participates in the following community-based commissions, committees, and workgroups:

- Pueblo Affordable Housing Collective (12 meetings per year)
- ADA Advisory Committee (monthly meetings)
- Community Services Advisory Commission (monthly meetings)
- Housing Update Call with the Colorado Division of Housing (monthly call)
- State of the City Open House (annual event)
- Regular meetings with Advance Pueblo, a collaboration of key stakeholders focused on economic development
- Citizen Advisory Committee for Pueblo's Superfund Site

The Division is co-located with the Pueblo County Department of Human Services, allowing for close coordination with programs such as LEAP, Weatherization, Commodities Distribution, and other social service initiatives.

Funding availability is publicly announced in the Pueblo Chieftain, in both English and Spanish, and on the City's website. A public hearing and project presentation meeting is held annually, where applicants present their proposals to the Citizen Advisory Committee. The Committee is composed of community volunteers representing each City Council district. Members review and rank applications using a rubric aligned with the Consolidated Plan's priority needs and goals, ensuring funding decisions are transparent, equitable, and data-driven.

Citizen Participation Outreach

Sort Order	Mode of Outreach	Target of Outreach	Summary of response/ attendance	Summary of comments received	Summary of comments not accepted and reasons	URL (If applicable)
1	Newspaper Ad	Non-targeted /broad community	Notice of funding availability open from May 1, 2023 through May 31, 2023	Applications for programs and projects included in this 2024 AAP	All applications were accepted; not all applications were able to be funded.	Link and application on City's Homepage
2	Newspaper Ad	Non-English Speaking - Specify other language: Spanish	Notice of funding availability open from May 1, 2023 through May 31, 2023	Applications for programs and projects included in this 2024 AAP	All applications were accepted; not all applications were able to be funded.	Link and application on City's Homepage
3	Newspaper Ad	Non-targeted /broad community	Notice of Public Hearing to receive public input on use of funding.	None	None	

Sort Order	Mode of Outreach	Target of Outreach	Summary of response/ attendance	Summary of comments received	Summary of comments not accepted and reasons	URL (If applicable)
4	Public Hearing	Non-targeted /broad community	A public hearing held in City Council Chambers following the grant request presentations.	Nineteen individuals were present and presented for themselves or the groups they represented.	None	Streamed Live on Zoom
5	Public Meeting	Non-targeted /broad community	Work Session with City Council on televised meeting and replayed for two weeks on the City Gov. Channel 17.	None	None	City Clerk is inviting you to a scheduled Zoom meeting. Join Zoom Meeting https://pueblo.zoom.us/j/83497433064 Meeting ID: 834 9743 3064 Passcode:
6	Internet Outreach	Non-targeted /broad community	City Council Work Session streamed live on Facebook.	None	None	

Sort Order	Mode of Outreach	Target of Outreach	Summary of response/ attendance	Summary of comments received	Summary of comments not accepted and reasons	URL (If applicable)
7	Newspaper Ad	Non-targeted /broad community	Notice of availability for Draft Annual Action Plan - available at the Division's Office, Rawlings Library, the City Clerk's Office, and on the Division's website.	One comment was received	All comments were accepted	https://www.pueblo.us/DocumentCenter/View/24322/2023-Annual-action-plan-PDF?bidId=

Sort Order	Mode of Outreach	Target of Outreach	Summary of response/ attendance	Summary of comments received	Summary of comments not accepted and reasons	URL (If applicable)
8	Newspaper Ad	Non-English Speaking - Specify other language: Spanish	Notice of availability for Draft Annual Action Plan - available at the Division's Office, Rawlings Library, the City Clerk's Office, and on the Division's website.	None	None	https://www.pueblo.us/DocumentCenter/View/24322/2023-Annual-action-plan-PDF?bidId=
9	Public Hearing	Non-targeted /broad community	City Council Meeting Aug 12, 2024e Ordinance to adopt 2024 Annual Action Plan	None	None	

Table 4 – Citizen Participation Outreach

Expected Resources

AP-15 Expected Resources - 91.420(b), 91.220(c)(1,2)

Introduction

Currently, the City receives CDBG and HOME funds for housing construction, rehabilitation initiatives, community and economic development and public services. These funding sources are expected to be available over the next five years. The City will also receive CDBG-CV funds to prevent, prepare for and respond to the pandemic.

Anticipated Resources

Program	Source of Funds	Uses of Funds	Expected Amount Available Year 1				Expected Amount Available Remainder of ConPlan $	Narrative Description
			Annual Allocation: $	Program Income: $	Prior Year Resources: $	Total: $		
CDBG	public - federal	Acquisition Admin and Planning Economic Development Housing Public Improvements Public Services	1,433,918.00	0.00	0.00	1,433,918.00	4,301,754.00	The expected amount remaining is three times the year 1 allocation assuming that the level of funding remains the same.Prior year CDBG resources include PY2016 ($309,795) and PY2017 ($59,715).

Program	Source of Funds	Uses of Funds	Expected Amount Available Year 1				Expected Amount Available Remainder of ConPlan $	Narrative Description
			Annual Allocation: $	Program Income: $	Prior Year Resources: $	Total: $		
HOME	public - federal	Acquisition Homebuyer assistance Homeowner rehab Multifamily rental new construction Multifamily rental rehab New construction for ownership TBRA	773,865.49	0.00	0.00	773,865.49	2,321,596.47	The expected amount remaining is three times the year 1 allocation assuming that the level of funding remains the same.

Table 2 - Expected Resources – Priority Table

Explain how federal funds will leverage those additional resources (private, state and local funds), including a description of how matching requirements will be satisfied

The City and County currently fund over 40 non-profit agencies through the Community Services Advisory Commission (CSAC) and other processes. The CSAC group, which funds the majority of these non-profit organizations, makes funding recommendations to the governing bodies of the City of Pueblo and Pueblo County. Over $6 million in City of Pueblo general funds have been granted to local agencies that serve the Pueblo community in 2025. These are general revenue funds, and allocations are made during the yearly budget process.

In addition, the City of Pueblo's Housing and Citizen Services Department regularly applies for grants from local and state sources. In 2025, the

City was awarded a grant for low-income homeowner rehabilitation and intends to continue to expand grant funding.

If appropriate, describe publically owned land or property located within the jurisdiction that may be used to address the needs identified in the plan

Discussion

Annual Goals and Objectives

AP-20 Annual Goals and Objectives - 91.420, 91.220(c)(3)&(e)

Goals Summary Information

Sort Order	Goal Name	Start Year	End Year	Category	Geographic Area	Needs Addressed	Funding	Goal Outcome Indicator
1	Preserve existing affordable units (rehab)	2020	2024	Affordable Housing	Citywide	Affordable Housing	CDBG: $185,000.00	Homeowner Housing Rehabilitated: 29 Household Housing Unit
2	New construction of affordable housing	2020	2024	Affordable Housing	Citywide Countywide	Affordable Housing	HOME: $715,799.00	Rental units constructed: 6 Household Housing Unit
3	Eliminate slum and blighting influences	2025	2029	Affordable Housing Non-Housing Community Development	Citywide	Economic Development and Community Revitalization	CDBG: $300,000.00	Buildings Demolished: 2 Buildings
5	Provide housing and services to homeless	2020	2024	Affordable Housing Homeless	Citywide	Public Services including Services for Homeless	CDBG: $160,892.00	Public service activities other than Low/Moderate Income Housing Benefit: 1958 Persons Assisted Public service activities for Low/Moderate Income Housing Benefit: 20 Households Assisted

Sort Order	Goal Name	Start Year	End Year	Category	Geographic Area	Needs Addressed	Funding	Goal Outcome Indicator
6	Provide public services to non-homeless population	2020	2024	Affordable Housing Non-Homeless Special Needs Non-Housing Community Development	Citywide	Public Services including Services for Homeless	CDBG: $46,372.00	Public Facility or Infrastructure Activities other than Low/Moderate Income Housing Benefit: 432 Persons Assisted
7	Improve and maintain public infrastructure and fac	2020	2024	Non-Housing Community Development	Citywide	Public Infrastructure and Facilities	CDBG: $1,156,455.00	Public Facility or Infrastructure Activities other than Low/Moderate Income Housing Benefit: 6032 Persons Assisted
8	Economic development	2025	2029	Non-Housing Community Development	Citywide	Economic Development and Community Revitalization	CDBG: $200,000.00 HOME: $.00	Facade treatment/business building rehabilitation: 5 Business
11	Planning and administration of federal programs	2020	2024	Affordable Housing Public Housing Homeless Non-Homeless Special Needs Non-Housing Community Development	Citywide Countywide	Administration and Planning	CDBG: $285,000.00 HOME: $87,754.52	Other: 2 Other
12	Fair housing education and outreach	2020	2024	Fair Housing	Citywide	Administration and Planning	CDBG: $.00 HOME: $.00	Other: 1 Other

Table 3 – Goals Summary

Goal Descriptions

1	**Goal Name**	Preserve existing affordable units (rehab)
	Goal Description	Rehabilitation/reconstruction of single and multi-family housing; energy efficiency improvements; accessibility modifications; lead based paint hazard testing and abatement; minor repairs; and preservation of affordable units.
2	**Goal Name**	New construction of affordable housing
	Goal Description	New construction of affordable housing units
3	**Goal Name**	Eliminate slum and blighting influences
	Goal Description	Demolish blighted unsafe structures.
5	**Goal Name**	Provide housing and services to homeless
	Goal Description	Housing and services for homeless and near homeless include outreach, emergency, transitional and permanent supportive housing, Rapid Re-Housing, supporting services and rental assistance
6	**Goal Name**	Provide public services to non-homeless population
	Goal Description	Other public services that are needed include: housing and services for persons with HIV/AIDS; services for persons with physical, developmental and/or intellectual disabilities; employment and workforce development; screening for lead-based paint hazards; housing counseling; neighborhood clean-up programs; crime awareness and prevention programs; transportation; health and mental health services; services for persons recovering from addiction; youth programs, food banks and other food-related services; childcare and related services; senior programs and related services; legal services; and financial literacy.

7	**Goal Name**	Improve and maintain public infrastructure and fac
	Goal Description	Public facilities include neighborhood facilities, parks/recreation facilities, parking facilities, senior and youth facilities, childcare facilities, job training facilities, cultural facilities, non-residential historic preservation, and homeless facilities. Public infrastructure includes street and sidewalk improvements including lighting and streetscaping, water and sewer improvements, flood drainage improvements, solid waste management improvements.
8	**Goal Name**	Economic development
	Goal Description	Create a program that allows business owners in high-blighted downtown corridors to access funding for building security upgrades and facade improvements. Funding will be leveraged with other funding sources.
11	**Goal Name**	Planning and administration of federal programs
	Goal Description	Planning and administration is required for the successful implementation of CDBG and HOME programs.
12	**Goal Name**	Fair housing education and outreach
	Goal Description	Education and outreach on fair housing to affirmatively further fair housing choice.

AP-35 Projects - 91.420, 91.220(d)

Introduction

The following projects will be funded using federal CDBG, HOME and CDBG-CV funds:

#	Project Name

Table 4 – Project Information

Describe the reasons for allocation priorities and any obstacles to addressing underserved needs

AP-38 Project Summary

Project Summary Information

Project Name	Target Area	Goals Supported	Needs Addressed	Funding	Description	Target Date
<TYPE=[pivot_table] REPORT_GUID=[54A4ED67473EDAEE248792836A1D83B0]>						

AP-50 Geographic Distribution - 91.420, 91.220(f)

Description of the geographic areas of the entitlement (including areas of low-income and minority concentration) where assistance will be directed

CDBG funds are eligible within the city limits, and will be targeted to serving a low income population. HOME funds are eligible to be expended within Pueblo county. Rental housing or rental units are the primary focus with these funds. The majority of rental housing is located within the city of Pueblo. There are no identified geographic priorities within the City or County. The funds will be expended as described below.

Geographic Distribution

Target Area	Percentage of Funds
Citywide	92
Countywide	8

Table 5 - Geographic Distribution

Rationale for the priorities for allocating investments geographically

The majority of funds will be allocated in the City of Pueblo because only the City receives CDBG and CDBG-CV funds so all of those funds will be expended within the City. The HOME funds are divided between the City and County with the vast majority going to the City. Within the City, funds are allocated in different neighborhoods to meet the needs of residents throughout the City.

Discussion

Access to transit, services, and broadband is limited outside the city limits. Directing the majority of the funding to promote housing and services within the city limits will benefit more low-income individuals and families and provide greater coordinated access to the funded services and amenities.

Affordable Housing

AP-55 Affordable Housing - 91.420, 91.220(g)

Introduction

The following tables outline the affordable housing goals funded with CDBG and HOME funds.

One Year Goals for the Number of Households to be Supported	
Homeless	200
Non-Homeless	0
Special-Needs	0
Total	200

Table 6 - One Year Goals for Affordable Housing by Support Requirement

One Year Goals for the Number of Households Supported Through	
Rental Assistance	10
The Production of New Units	2
Rehab of Existing Units	22
Acquisition of Existing Units	0
Total	34

Table 7 - One Year Goals for Affordable Housing by Support Type

Discussion

Per 91.220(1), there are some program-specific requirements for HOME as described below. Eligible applicants for HOME-funded programs are all low- and moderate-income households residing in the City or County or projects that are to be completed by developers, for example, that seeks to construct or rehabilitate units that are income-restricted. This includes applications for HOME funds in support of Low Income Housing Tax Credit (LIHTC) projects or RAD conversions undertaken by the Housing Authority.

HOME applications for affordable housing development will be taken monthly on a rolling basis, as projects are being developed. DHCS will review HOME Program applications in accordance with the Application checklist and on the following criteria:

- Affordable Housing Experience: Capacity must be demonstrated by including an application that identifies all necessary components to accomplish the development, e.g., effective control of sites for acquisition and construction developments, the financial capacity to repay the HOME loan and other financial arrangements, as well as comprehensive program design. DHCS's HOME Program staff will

conduct reviews of:

a. Previous performance under the HOME Program and other related programs, including disbursements, monitoring and findings;

b. Relevant experience in administering housing programs;

c. Relevant experience in developing and managing housing programs and;

d. Size of staff relative to all other program responsibilities.

- Housing Need Factor: The need factor pertains to percentages of the city's lower income households, the percentage of households with housing costs greater than thirty percent (30%) of area median family income adjusted for family size.

- Financing: DHCS places a strong emphasis on projects that will include the use of funds from other sources. All costs will be examined for reasonableness, and applicants may be denied if costs are deemed unreasonable.

The Consortium will not issue a funding commitment until all other commitments are in place. Proof of these commitments will be required prior to Council approval and execution of contracts.

- Readiness: The purpose of the application process is to allocate funds to eligible applicants for proposed projects. Applicants applying for HOME Program funds must begin their developments within ninety (90) days of the notice to proceed. Developments that do not begin within ninety (90) days are subject to have all HOME Program funds recaptured and reallocated to other eligible activities unless otherwise approved by DHCS. DHCS realizes that there may be extenuating circumstances that may delay the beginning of a project. Such circumstances will be reviewed on a case-by-case basis.

Program and services funding available through the CDBG Program is awarded through an annual NOFA process.

AP-60 Public Housing - 91.420, 91.220(h)

Introduction

Actions planned will address the needs to public housing.

Actions planned during the next year to address the needs to public housing

Over the last six years, the HACP has been executing a four-phased Rental Assistance Demonstration (RAD) project, which converts a 212-unit Public Housing development into four separate projects. The HACP has been successful in leveraging public/private partnerships and funding for each of the phases. The City of Pueblo has used entitlement funding for each of the three completed projects and anticipates an application for the fourth phase when the HACP is awarded tax credit equity.

Actions to encourage public housing residents to become more involved in management and participate in homeownership

HACP continues to try to increase resident involvement in management by providing regular resident meetings where residents can express concerns to housing management. The Agency maintains a strong working relationship with the City-wide resident organization, which provides resident involvement in strategic and agency planning.

HACP also administers the Family Self-Sufficiency Program, which is a five-year voluntary program for participants in both the Housing Choice Voucher and the Public Housing programs. The program is designed to help individuals with improving their economic status by reducing their dependence on public assistance.

The Family Self Sufficiency Coordinator will assist with developing an individualized plan leading to self-reliance and identifying the steps and activities that need to be taken to reach those goals.

There are various referrals to supportive social services such as childcare, job preparation, credit counseling, education, home ownership, transportation, and vocational training.

If the PHA is designated as troubled, describe the manner in which financial assistance will be provided or other assistance

Not applicable as the HACP is not designated as troubled.

Discussion

AP-65 Homeless and Other Special Needs Activities - 91.420, 91.220(i)

Introduction

The City of Pueblo is committed to supporting individuals experiencing homelessness or at risk of becoming homeless through various initiatives. These efforts focus on shelter services, prevention programs, and outreach strategies.

1. Homeless Services

The City of Pueblo owns and operates the community's only homeless shelter, with wraparound services coordinated by the Department of Community and Human Services (DCHS). Funding for shelter operations is available through the Community Development Block Grant (CDBG) program, with additional capital upgrades planned through both CDBG and HOME funding sources.

2. Homelessness Prevention

Through partnerships with nonprofit organizations, the CDBG program provides financial support for eviction prevention efforts, helping individuals and families remain stably housed.

3. Outreach Efforts

The City also supports outreach initiatives, including CDBG-funded programs such as youth outreach, designed to connect vulnerable populations with essential services.

By leveraging local resources and funding opportunities, the City of Pueblo remains committed to addressing homelessness through coordinated services, prevention strategies, and targeted outreach.

Describe the jurisdictions one-year goals and actions for reducing and ending homelessness including

Reaching out to homeless persons (especially unsheltered persons) and assessing their individual needs

The Pueblo CoC, which is part of the Colorado Balance of State, has a long-term goal of decreasing the number of persons experiencing homelessness by moving individuals and families from homelessness into permanent housing. To achieve this objective, the CoC meets regularly to monitor, discuss ongoing needs and issues that affect those impacted by homelessness. Health Solutions serves as the lead CoC agency and provides outreach to assess the individual needs of those experiencing homelessness. The CoC is engaging in the Built for Zero campaign, which is an approach that seeks to end homelessness

using a By-Names list for each subcategory (i.e. veterans, families, etc.).

Addressing the emergency shelter and transitional housing needs of homeless persons

The City of Pueblo is actively addressing emergency shelter and transitional housing needs for individuals experiencing homelessness through a combination of shelter services, prevention initiatives, and outreach efforts.

Emergency Shelter Services

The City owns and operates Pueblo's only homeless shelter, ensuring access to safe and stable temporary housing. Wraparound services are coordinated by the Department of Community and Human Services (DCHS) to provide comprehensive support. Funding for shelter operations is available through the Community Development Block Grant (CDBG) program, with additional capital upgrades planned using both CDBG and HOME funding sources.

Transitional Housing & Prevention Efforts

To support long-term stability, the City collaborates with nonprofit partners to prevent homelessness through eviction prevention programs funded by the CDBG program. These efforts help individuals and families avoid displacement and transition to stable housing.

Outreach & Community Engagement

Recognizing the importance of outreach, the City funds initiatives such as youth outreach programs through CDBG, ensuring that vulnerable populations receive access to resources that promote stability and reintegration into the community.

By leveraging local resources and funding opportunities, the City of Pueblo remains committed to providing both immediate shelter and long-term housing solutions for individuals experiencing homelessness.

Helping homeless persons (especially chronically homeless individuals and families, families with children, veterans and their families, and unaccompanied youth) make the transition to permanent housing and independent living, including shortening the period of time that individuals and families experience homelessness, facilitating access for homeless individuals and families to affordable housing units, and preventing individuals and families who were recently homeless from becoming homeless again

The City of Pueblo remains committed to ensuring housing stability and providing critical assistance to individuals experiencing homelessness or at risk of becoming homeless. These efforts focus on three key

areas:

1. Homeless Services

The City owns and operates Pueblo's only homeless shelter, with wraparound services coordinated by the Department of Community and Human Services (DCHS). Shelter operations are supported through Community Development Block Grant (CDBG) funding, with additional capital upgrades planned using both CDBG and HOME funding.

2. Homelessness Prevention

Through strategic partnerships with nonprofit organizations, the City invests CDBG funds in eviction prevention programs, helping residents maintain stable housing and avoid displacement.

3. Outreach Initiatives

The City supports various outreach efforts, including youth outreach programs, homelessness prevention services, and operational funding for housing providers—all made possible through CDBG funding.

Despite these ongoing efforts, **funding remains the primary challenge** in expanding housing and support services for individuals and families experiencing homelessness. This issue is expected to intensify as eviction moratoria are lifted, leading to an increase in displacement.

The City of Pueblo remains dedicated to investing CDBG funds strategically to provide essential services and address the evolving needs of the community.

Helping low-income individuals and families avoid becoming homeless, especially extremely low-income individuals and families and those who are: being discharged from publicly funded institutions and systems of care (such as health care facilities, mental health facilities, foster care and other youth facilities, and corrections programs and institutions); or, receiving assistance from public or private agencies that address housing, health, social services, employment, education, or youth needs.

The City of Pueblo remains committed to ensuring housing stability and providing critical assistance to individuals experiencing homelessness or at risk of becoming homeless. These efforts focus on three key areas:

1. Homeless Services

The City owns and operates Pueblo's only homeless shelter, with wraparound services coordinated by the Department of Community and Human Services (DCHS). Shelter operations are supported through

Community Development Block Grant (CDBG) funding, with additional capital upgrades planned using both CDBG and HOME funding.

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Through strategic partnerships with nonprofit organizations, the City invests CDBG funds in eviction prevention programs, helping residents maintain stable housing and avoid displacement.

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Despite these ongoing efforts, **funding remains the primary challenge** in expanding housing and support services for individuals and families experiencing homelessness. This issue is expected to intensify as eviction moratoria are lifted, leading to an increase in displacement.

The City of Pueblo remains dedicated to investing CDBG funds strategically to provide essential services and address the evolving needs of the community.

Discussion

AP-75 Barriers to affordable housing -91.420, 91.220(j)

Introduction

The City of Pueblo recently completed an in-depth Analysis of Impediments to Affordable Housing, identifying critical barriers—from restrictive land-use controls and zoning ordinances to burdensome fees and outdated building codes—that limit access to affordable housing. The study not only highlights these challenges but also proposes actionable solutions designed to ameliorate the negative effects of current public policies, paving the way for a more robust and equitable housing market.

Actions it planned to remove or ameliorate the negative effects of public policies that serve as barriers to affordable housing such as land use controls, tax policies affecting land, zoning ordinances, building codes, fees and charges, growth limitations, and policies affecting the return on residential investment

The City is actively working to remove barriers to affordable housing, including:

- **Zoning and Land Use Reforms:** The City of Pueblo is actively revising its zoning ordinances through the update of its Unified Development Code (UDC). The goal is to relax restrictions on multifamily housing—especially in infill areas—and to expand the definition of "family" so that more flexible occupancy arrangements are allowed. In addition, the plan includes permitting manufactured or modular housing on lots traditionally reserved for single-family dwellings. Similar revisions are being pursued at the county level to encourage a wider range of housing developments.
- **Modernizing Building Codes and Construction Standards:** To reduce overall development costs and improve the return on residential investment, the City is exploring adjustments in building codes and energy standards. This initiative involves assessing alternative construction methods (such as offsite manufacturing, panelized construction, and repurposed shipping containers) that can lower material, labor, and time costs for affordable housing projects.
- **Financial Incentives and Streamlined Development Processes:** Both the City and County are working on creating incentive policies, including fee waivers, tax abatements, and reduced permit costs. These measures aim to lessen the financial burdens imposed by current fees and charges, encouraging private investment in affordable housing. The City's recent award of a Local Capacity Planning Grant from the Department of Local Affairs supports this effort, enabling faster project approvals and more coordinated collaboration among departments.
- **Utilization and Management of Public Land:** The local government intends to reform its acquisition and disposition policies regarding city-owned real estate. By acquiring land at favorable rates and offering it to developers with incentive packages, the City aims to remove barriers related to land cost and availability, thus facilitating new residential infill development.
- **Coordinated Planning and Funding Strategies:** Finally, by leveraging regional comprehensive planning processes and programs such as CDBG, HOME, and State Proposition 123, the City and County are pursuing multiple funding streams to address affordability gaps. These coordinated

efforts include enhanced communication and streamlined administrative procedures among local agencies, which help mitigate the restrictive growth limitations and tax policies that currently impact housing development.

Discussion

AP-85 Other Actions - 91.420, 91.220(k)

Introduction

The following section describes other actions to be taken to meet the needs of the community.

Actions planned to address obstacles to meeting underserved needs

The primary obstacle to meeting underserved needs is the limited funding resources available to address identified priorities. In addition, the gap in what households can afford to pay for housing and the price of housing is another obstacle to meeting the needs of the underserved. The City has a lack of decent, affordable units to meet the needs of the community.

The effect of greater community needs in the form of homelessness, risk of homelessness, the increased demand for supportive services (particularly for persons with multi-system contact), rising cost of housing and stagnant wages and an aging housing stock in need of revitalization while funding remains largely stagnant or is decreasing in real dollars puts added pressures on the systems within the City.

The City of Pueblo will continue to partner with other public agencies and non-profit organizations, when feasible, to leverage resources and maximize outcomes in housing and community development.

Lastly, the City and the County contribute approximately $1m annually toward funding various public services agencies. While the need remains greater than the available resources, funding is critical in the community.

Actions planned to foster and maintain affordable housing

The City will utilize its CDBG funds to implement the DHCS's five housing strategies. Specifically, the CDBG funding will be used to help preserve Pueblo's aging and dilapidated housing stock. This is done through several housing rehabilitation programs, including programs for seniors and for persons needing accessibility modifications to age in place. The CDBG funding is leveraged using both City of Pueblo general funding and paired with state and other grant funding opportunities available. These housing rehabilitation programs work to maintain the quality of the affordable housing stock occupied by low- and moderate-income households.

The City may also use CDBG or HOME funding to implement other housing strategies, which include:

1. **Boarded, Blighted & Burnt** – Identify redevelopment solutions for homes that need demolition due to lack of maintenance, condemnation, structural failure, or fires.
2. **Rehabilitation** – Preserve existing housing stock by expanding funding for low- and moderate-income homeowners who need home repairs.
3. **Infrastructure** – Assist with infrastructure fees for affordable housing development. Add infrastructure to existing City-owned vacant parcels to create development-ready properties.

4. **Blighted Commercial** – Assist with the acquisition and demolition of properties with large vacant commercial buildings to make sites ready for redevelopment of high-density residential units.
5. **Homeless Housing Options** – Create transitional housing options for individuals exiting homelessness, including non-congregate sheltering options and support for Rapid Re-Housing and Permanent Supportive Housing.

Additionally, the City will utilize HOME funds toward the new construction of rental units in the Compass Pointe Development.

Actions planned to reduce lead-based paint hazards

The Pueblo County Department of Public Health and Environment operates a lead blood testing program for residents. The lead program offers the following service to residents of the County:

- Lead risk and hazard reduction education to resident owners, property managers, and tenants.
- Lead risk and hazard reduction education for occupational and hobby exposures.
- Environmental testing program for Lead hazard screening (cost: $42.00/hour or no cost to those located within the Superfund Study Area).
- Blood Lead screening for children up to age 16, women of child-bearing age, pregnant or nursing women; and
- Blood Lead monitoring program for children with blood levels at or above 5.0 µg/dL.

The County also provides additional information regarding the common sources of lead exposure, potential health effects and methods to reduce exposure.

The City will continue to work with the Health Department as needed to reduce lead-based paint hazards and will continue to comply with all regulatory requirements of the CDBG and HOME programs as related to lead-based paint.

Actions planned to reduce the number of poverty-level families

Ongoing efforts to strengthen economic development and provide the City's lowest-income households with needed housing-related assistance and services directly address needs identified in this plan. The City will work with existing agencies that serve persons in poverty in order to evaluate their needs, coordinate the delivery of services, and determine if funding assistance should be made available through the CDBG Program in cases where there are insufficient resources to meet the identified needs. In addition, the City will:

- continue to work to coordinate community development strategies, needs assessments and

integrated planning.

- continue to work within the Continuum of Care process and other coordinating agencies to reduce duplication, improve integration, and identify unmet service needs.
- expand coordination among local funding entities to streamline the application process, and to maximize the impact of those resources.
- provide letters of support and other documentation to agencies in support of their fundraising efforts.
- enhance public access to information about community services.

Actions planned to develop institutional structure

The City of Pueblo is committed to the continued coordination of all Anti-Poverty and Community Development initiatives. The City has entered into several intergovernmental agreements with other entities such as Pueblo County to administer the CSAC process, which allocates general revenue funds from both entities to non-profit agencies and economic development organizations that enhance the quality of life in the community.

Actions planned to enhance coordination between public and private housing and social service agencies

Meaningful collaboration as it relates to the development and implementation of housing and community development programs and services has become increasingly important as the federal resources available to these programs continue to decline. Collaboration with housing and service providers helps the City to capture the maximum benefit for each dollar it invests and ensures that investments strategically address both short-term needs and advance long-term goals.

The Department of Housing and Citizen Services conducts ongoing consultation with human services agencies, housing development organizations, and municipalities at various points in time during a program year.

Discussion

Program Specific Requirements

AP-90 Program Specific Requirements - 91.420, 91.220(l)(1,2,4)

Introduction

The following section describes program-specific requirements for the CDBG and HOME programs.

Community Development Block Grant Program (CDBG)
Reference 24 CFR 91.220(l)(1)

Projects planned with all CDBG funds expected to be available during the year are identified in the Projects Table. The following identifies program income that is available for use that is included in projects to be carried out.

1. The total amount of program income that will have been received before the start of the next program year and that has not yet been reprogrammed	0
2. The amount of proceeds from section 108 loan guarantees that will be used during the year to address the priority needs and specific objectives identified in the grantee's strategic plan.	0
3. The amount of surplus funds from urban renewal settlements	0
4. The amount of any grant funds returned to the line of credit for which the planned use has not been included in a prior statement or plan	0
5. The amount of income from float-funded activities	0
Total Program Income:	**0**

Other CDBG Requirements

1. The amount of urgent need activities	0
2. The estimated percentage of CDBG funds that will be used for activities that benefit persons of low and moderate income.Overall Benefit - A consecutive period of one, two or three years may be used to determine that a minimum overall benefit of 70% of CDBG funds is used to benefit persons of low and moderate income. Specify the years covered that include this Annual Action Plan.	100.00%

HOME Investment Partnership Program (HOME)
Reference 24 CFR 91.220(l)(2)

1. A description of other forms of investment being used beyond those identified in Section 92.205 is as follows:

   The County does not anticipate receiving any additional program income for its HOME programs

during FY 2025.

2. A description of the guidelines that will be used for resale or recapture of HOME funds when used for homebuyer activities as required in 92.254, is as follows:

When HOME Program funds are used to assist a household in the purchase of a unit, restrictions will be placed on the unit to ensure compliance with the resale and recapture requirements described in 24 CFR 92.254(a)(5), as amended through July 2013. This section sets forth the method that will be used by the Consortium to enforce these requirements.

The HOME Down payment Assistance Program will require a default. In the event of a default, as defined under the note and deed, and where net proceeds are sufficient to repay both the City's HOME investment and the homeowner investment, a full repayment of the direct HOME subsidy will be required.

The City of Pueblo elects to enforce the Recapture Provisions of the HOME Program, recapturing the direct HOME subsidy under the following conditions:

The City of Pueblo will recapture the direct subsidy amount of the HOME Program funds provided to the homebuyer/homeowner on an approved activity or recapture the maximum net proceeds from sale of property (whether recapture is affected through foreclosure or no foreclosure action).

- When net proceed exceed superior debt and the amount of direct HOME subsidy invested, the City will recapture the entire direct HOME subsidy provided.
- When net proceeds are insufficient to cover superior debt, the direct HOME subsidy will be forgiven.
- When net proceeds are insufficient to reimburse the entire direct HOME subsidy provided, but are in excess of the superior debt, the balance (Direct Subsidye- Net Proceeds) will be recaptured by the City.

Net proceeds recovered will be used to:

(1) Reimburse the HOME Program (approved activity) for the outstanding balance of HOME funds not repaid or forgiven during the applicable affordability period at the time of recapture.

(2) Reimburse the HOME Program (administration) for "holding costs" or other costs associated with the recapture action (legal fees, insurance, taxes, realtor fees, appraisal/BPO costs, etc.). If net proceeds recaptured are less than the outstanding balance of the direct HOME subsidy invested in

the property (for all approved activities and holding costs incurred), the loss will be absorbed by the HOME Program and all HOME Program requirements would be considered to have been satisfied. If net proceeds recaptured are greater than the outstanding balance of direct HOME subsidy invested in the property (for all approved activities and holding costs incurred), the balance of net proceeds will be distributed to the homeowner (or his/her estate). If the recapture of proceeds is effectuated through a completed foreclosure action, and the property is legally owned by the City of Pueblo, the balance of net proceeds recaptured will inure to the City of Pueblo.

For those cases where the affordability requirements are violated as a result of the death of the HOME beneficiary and there is an eligible person who qualified and is desirous of assuming the HOME assistance invested in the property, DHCS will permit sale of the HOME-assisted unit to the qualifying, eligible person, contingent upon DHCS's prior review and approval. The subsequent owner will be required to adhere to all applicable affordability requirements for the unexpired term of the original affordability period.

3. A description of the guidelines for resale or recapture that ensures the affordability of units acquired with HOME funds? See 24 CFR 92.254(a)(4) are as follows:

   Funding provided to developers of affordable rental housing will also be recaptured unless all of the following circumstances are demonstrated to exist: (i) more than 15 to 20 years have elapsed since the substantial completion of the project, or the City approves transfer of the Project and waives acceleration of the indebtedness, which transfer may be approved or disapproved in the sole discretion of the City, (ii) the primary lender also consents to assumption of the mortgage or obligation to which the deed of trust securing the agreement is subordinate, (iii) the sale of the Property is to a subsequent purchaser who agrees in writing to comply with the affordability requirements set forth at 24 CFR, §92.252, (iv).

   All subrecipient, developers, owner and sponsor HOME agreements contain clauses stating project lease-up requirements. The City has amended the written guidelines to address changes promulgated by the 2013 New HOME Rule. All new for-sale single-family projects will have provisions within the written agreement calling out the new HOME Investment Partnership Act requirement that all units not sold within 9 months of completion will be converted to rental.

4. Plans for using HOME funds to refinance existing debt secured by multifamily housing that is rehabilitated with HOME funds along with a description of the refinancing guidelines required that will be used under 24 CFR 92.206(b), are as follows:

   The Consortium does not permit the use of HOME funds to refinance existing debt secured by

multifamily or single-family housing that is being rehabilitated with HOME funds.

5. If applicable to a planned HOME TBRA activity, a description of the preference for persons with special needs or disabilities. (See 24 CFR 92.209(c)(2)(i) and CFR 91.220(l)(2)(vii)).

   The City of Pueblo does not directly administer HOME TBRA. Any preferences outlined would be based on the subrecipient's policies and procedures administering TBRA. Tenant selection plans are reviewed as part of a TBRA allocation.

6. If applicable to a planned HOME TBRA activity, a description of how the preference for a specific category of individuals with disabilities (e.g. persons with HIV/AIDS or chronic mental illness) will narrow the gap in benefits and the preference is needed to narrow the gap in benefits and services received by such persons. (See 24 CFR 92.209(c)(2)(ii) and 91.220(l)(2)(vii)).

   The City of Pueblo does not directly administer HOME TBRA. Any preferences outlined would be based on the subrecipient's policies and procedures administering TBRA. Tenant selection plans are reviewed as part of a TBRA allocation.

7. If applicable, a description of any preference or limitation for rental housing projects. (See 24 CFR 92.253(d)(3) and CFR 91.220(l)(2)(vii)). Note: Preferences cannot be administered in a manner that limits the opportunities of persons on any basis prohibited by the laws listed under 24 CFR 5.105(a).

   The City of Pueblo does not directly administer HOME TBRA. Any preferences outlined would be based on the subrecipient's policies and procedures administering TBRA. Tenant selection plans are reviewed as part of a TBRA allocation.

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Bella Trujillo, Director of Human Resources
Melissa Cook, Director Department of Housing & Citizen Services

SUBJECT: AN ORDINANCE AMENDING THE FISCAL YEAR 2026 STAFFING ORDINANCE BY ADDING ONE (1) FULL-TIME POSITION ENTITLED HOUSING REDEVELOPMENT PROGRAM COORDINATOR TO THE AUTHORIZED STAFFING OF THE HOUSING AND CITIZEN SERVICES DEPARTMENT

SUMMARY:

The Housing & Citizen Services Department requests to add one full-time position to develop, manage and administer the housing redevelopment program by leading strategic initiatives to eliminate blight, stabilize neighborhoods, and catalyze reinvestment using public sector and private sector financing tools.

PREVIOUS COUNCIL ACTION:

On December 8, 2025, Ordinance No. 11084 was approved by City Council. This Ordinance provided authorized staffing for Fiscal Year 2026.

BACKGROUND:

The City has identified over 200 long-term vacant residential properties requiring significant rehabilitation or demolition. Many of these properties are unlikely to be redeveloped without direct government intervention. To address this, the Department of Housing and Citizen Services has identified a viable financing mechanism to address this blight.

The identified program provides access to up to five times a jurisdiction's annual CDBG allocation through an up-front loan secured by collateral and/or future CDBG grant years. An overview of this opportunity was presented to City Council at the December 22, 2025, Work Session.

Although the loan will require future Council approval, the program's complexity necessitates substantial preparatory work, including project scoping, financial modeling, and securing site control for numerous properties. This workload exceeds the

Department's current staffing capacity.
To support this effort, the Department of Housing and Citizen Services has secured a $90,000 administrative planning grant from the Department of Local Affairs, already budgeted and appropriated in PL2402. Additional administrative funds from HOME-ARP (HOARP10) and CDBG-CV (CDCV010) are available to sustain this position for at least one year.
The individual hired in this role will lead efforts to rehabilitate and/or demolish long-term vacant and blighted residential properties. Within six months of hire, the Department will present a comprehensive funding plan to Council utilizing the HUD Section 108 Loan Guarantee Program and other financing tools to initiate redevelopment activities.
This position is critical to the success of the City's blight removal and redevelopment strategy.
If a comprehensive strategy is not identified and additional funding is not secured before the initially secured funding as outlined is exhausted, the position will no longer exist and will not draw on General Funds.

FINANCIAL IMPLICATIONS:

All costs associated with this proposal will be paid from grant funding received through Proposition 123 Local Planning Grant PL2402. In addition, some activities may be billed to administration of other Department of Housing and Citizen Services grants, including the CDBG Program, HOME Program, and pandemic-related funding (CDCV010 and HOARP10).
The current funding is anticipated to last approximately one (1) year. The intent is this position will become sustained with Section 108 loan proceeds and program income as a result of the program and have the potential for multi-year extension. However, if this position does not generate the anticipated program income or have eligible administrative expenses through the Section 108 program, this position would not be extended.

The cost of the Housing Redevelopment Program Manager position is approximately $56,183 for the remainder of 2026.

Cost Item	Per Month Cost 2026*	Approximate Annual Cost	Estimated Actual Cost 2026 (5 months)
Salary	$ 7,038	$ 84,457	$ 35,190
Retirement (PERA)	$ 1,112	$ 13,344	$ 5,560
Health Insurance	$ 2,954	$ 35,442	$ 14,768
Dental Insurance	$ 25	$ 300	$ 125
Life Insurance	$ 6	$ 72	$ 30
Medicare	$ 102	$ 1,225	$ 510
Estimated Position Cost	**$ 11,237**	**$ 134,839**	**$ 56,183**

* Assumes hire in at Step 1 of the salary scale

BOARD/COMMISSION RECOMMENDATION:

Not Applicable

STAKEHOLDER PROCESS:

None.

ALTERNATIVES:

The no action alternative would be to retain current staffing levels. Without approval of

this Ordinance, the City of Pueblo will not be able to adequately support the important work of the program.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

None

ORDINANCE NO.

AN ORDINANCE AMENDING THE FISCAL YEAR 2026 STAFFING ORDINANCE BY ADDING ONE (1) FULL-TIME POSITION ENTITLED HOUSING REDEVELOPMENT PROGRAM COORDINATOR TO THE AUTHORIZED STAFFING OF THE HOUSING AND CITIZEN SERVICES DEPARTMENT

WHEREAS, it is necessary to revise the positions for the ultimate efficiency and functionality for the City of Pueblo Department of Housing and Citizen Services; NOW THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The following section captioned "Housing & Citizen Services" of Ordinance No. 11084, being the 2026 Staffing Ordinance, is amended as follows:

Housing & Citizen Services	
Director Housing & Citizen Services	1
Administrative Technician	1
Community Development Specialist	1
Housing/Community Development Coordinator II	1
Housing and Community Development Specialist	1
Housing Redevelopment Program Manager	**1**
Total	**[5] 6**

SECTION 2.

The officers and staff of the City are directed and authorized to perform any and all acts consistent with the intent of this Ordinance to effectuate any transactions described therein.

SECTION 3.

This Ordinance shall be deemed to amend the Fiscal Year 2024 Budget and staffing with respect to the number and allocation of positions within the Mayor's Office and shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Bella Trujillo, Director of Human Resources

SUBJECT: AN ORDINANCE AMENDING SECTION 6-5-16 OF CHAPTER 5, OF TITLE VI OF THE PUEBLO MUNICIPAL CODE RELATING TO THE FY 2026 CLASSIFICATION AND PAY PLAN BY ESTABLISHING THE PAY SCALE FOR HOUSING REDEVELOPMENT PROGRAM COORDINATOR

SUMMARY:

Attached for consideration is an amended Pay Plan Ordinance that reflects the addition of the pay rate and salary schedule for the classification of Housing Redevelopment Program Coordinator.

PREVIOUS COUNCIL ACTION:

On December 8, 2026, City Council approved Ordinance No.11875, which established the Fiscal Year 2026 Classification and Pay Plan.

BACKGROUND:

This new position in the Housing and Citizen Services Department will be classified as a Class B position and will be subject to all hiring procedures under Civil Services rules and regulations.

FINANCIAL IMPLICATIONS:

None.

BOARD/COMMISSION RECOMMENDATION:

None.

STAKEHOLDER PROCESS:

None.

ALTERNATIVES:

The suggested change establishes the 2026 salary range for the classification of Housing Redevelopment Program Coordinator. If this ordinance is not approved, and assuming the establishment of the position is approved, no salary range will be associated with the classification and the position cannot be filled.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

None

ORDINANCE NO.

AN ORDINANCE AMENDING SECTION 6-5-16 OF CHAPTER 5, OF TITLE VI OF THE PUEBLO MUNICIPAL CODE RELATING TO THE FY 2026 CLASSIFICATION AND PAY PLAN BY ESTABLISHING THE PAY SCALE FOR HOUSING REDEVELOPMENT PROGRAM COORDINATOR

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Section 6-5-16(A) of Chapter 5, of Title VI, of the Pueblo Municipal Code referencing the Fiscal Year 2026 pay scale for the classification of Housing Redevelopment Program Coordinator.

6-5-16. Schedule, classification, work week and monthly salary.

The following shall constitute:

A. The monthly pay range for the classification of Housing Redevelopment Program Coordinator for 2026.

CITY OF PUEBLO SALARY SCHEDULE
MONTHLY SALARY SCHEDULE – CLASS B (EXEMPT)
2026

CLASS TITLE	*BASE SALARY*	MERIT PAY RANGES GRANTED UNDER SECTION 6-5-1(B)					
(B) ADMINISTRATIVE							
Housing Redevelopment Program Coord	7038.05	7415.77	7833.70	8263.77	8718.44	9197.76	9703.58

SECTION 2.

The officers and staff of the City are directed and authorized to perform any and all acts consistent with the intent of this Ordinance to effectuate the transactions described therein.

SECTION 3.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Greg Pedroza, Director Aviation

SUBJECT: AN ORDINANCE APPROVING A T-HANGAR LEASE AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO HOME RULE MUNICIPAL CORPORATION, AND DANIEL J. RAMOS FOR HANGAR UNIT B AT 31501 BRYAN CIRCLE AT PUEBLO MEMORIAL AIRPORT

SUMMARY:

Attached is an Ordinance approving a T-Hangar Lease Agreement between the City of Pueblo and Daniel J. Ramos for Hangar Unit B at 31501 Bryan Circle, located at the City's east-side T-hangar complex at Pueblo Memorial Airport. The Lease commences June 15, 2026, has an initial term of one year with up to four one-year renewal options, and provides monthly rent of $265.00 set by the Schedule of Rates and Charges adopted by City Council.

PREVIOUS COUNCIL ACTION:

Council previously approved a T-Hangar Lease Agreement with Mr. Ramos for a separate unit at the same complex by Ordinance No. 9448. The monthly rate of $265.00 referenced in this Lease was established by Ordinance No. 10811.

BACKGROUND:

The City of Pueblo owns and operates Pueblo Memorial Airport, including the T-hangar complex located on the east side of the airfield at 31501 Bryan Circle. Hangar Unit B at that complex is presently vacant. Mr. Ramos has applied to lease Hangar Unit B for the storage of an aircraft.

This Lease is the first to be issued on the updated T-Hangar Lease template prepared by the Department of Law in coordination with the Department of Aviation. The updated template addresses several recurring issues identified in prior hangar leases, including affirmative renewal upon written notice from the Lessee, prohibition of subleasing and encumbrance of the leasehold, alignment of rent with the Schedule of Rates and Charges adopted by Council, and a Lessor reservation covering construction activities

and operational restrictions during airshows, federally protected travel, military operations, and emergency response.

The Lease has an initial term of one year commencing June 15, 2026, with four one-year renewal options exercisable by Mr. Ramos on at least fourteen days' written notice. The aggregate term, including all renewals, is capped at five years. Either party may terminate the Lease on fourteen days' written notice. Mr. Ramos is required to maintain commercial general liability insurance with limits of $1,000,000 per occurrence and $3,000,000 in the aggregate, naming the City as additional insured and loss payee. The Premises are leased AS IS, and Mr. Ramos assumes the risk of loss, damage, or injury with respect to the Aircraft and personal property kept at the Premises.

The Lease has been approved as to form by the City Attorney.

FINANCIAL IMPLICATIONS:

The City will receive $265.00 per month, or $3,180.00 over the initial one-year term, in rental revenue. The rate is set by the Schedule of Rates and Charges and is subject to Council adjustment at any time, with the adjusted rate applying to any subsequent renewal term elected by the Lessee. Over the maximum five-year aggregate term, total rental revenue at the rate in effect on the Effective Date is $15,900.00. Rent revenue is dedicated to airport purposes consistent with PMC § 3-1-7.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If this Ordinance is not approved, Hangar Unit B will remain vacant and the City will forgo the rental revenue described above.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. RAMOS 2026 06 15 LEASE AGREEMENT

ORDINANCE NO.

AN ORDINANCE APPROVING A T-HANGAR LEASE AGREEMENT BETWEEN THE CITY OF PUEBLO, A COLORADO HOME RULE MUNICIPAL CORPORATION, AND DANIEL J. RAMOS FOR HANGAR UNIT B AT 31501 BRYAN CIRCLE AT PUEBLO MEMORIAL AIRPORT

WHEREAS, the City of Pueblo owns and operates the Pueblo Memorial Airport ("**Airport**"), the City having authority under C.R.S. §§ 41-4-201 and 41-4-204 to acquire, establish, construct, own, control, lease, equip, improve, maintain, operate, and regulate the Airport, and to exact and require charges, fees, and tolls in connection therewith; and

WHEREAS, the City owns and manages the T-Hangar facility identified herein and desires to lease one such T-Hangar unit to Lessee for the storage of an aircraft, and Lessee desires to lease the same upon the terms and conditions set forth herein.

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The T-Hangar Lease Agreement ("Agreement") between the City of Pueblo, a Colorado home rule municipal corporation, and Daniel J. Ramos, dated June 15, 2026, a copy of which is attached hereto, having been approved as to form by the City Attorney, is hereby approved.

SECTION 2.

The Mayor is authorized to execute the Agreement in the name of the City, and the City Clerk is directed to affix the seal of the City thereto and attest same.

SECTION 3.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance and the attached Agreement to effectuate the policies and procedures described therein.

SECTION 4.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

CITY OF PUEBLO
DEPARTMENT OF AVIATION
T-HANGAR LEASE AGREEMENT

This T-Hangar Lease Agreement ("**Lease**") entered into this 15th day of June, 2026 ("**Effective Date**"), between the City of Pueblo, a Colorado home rule municipal corporation ("**City**"), and Daniel J. Ramos, whose address is 510 Floyd Lane, Pueblo, CO 81005 ("**Lessee**").

RECITALS

WHEREAS, the City of Pueblo owns and operates the Pueblo Memorial Airport ("**Airport**"), the City having authority under C.R.S. §§ 41-4-201 and 41-4-204 to acquire, establish, construct, own, control, lease, equip, improve, maintain, operate, and regulate the Airport, and to exact and require charges, fees, and tolls in connection therewith; and

WHEREAS, the City owns and manages the T-Hangar facility identified herein and desires to lease one such T-Hangar unit to Lessee for the storage of an aircraft, and Lessee desires to lease the same upon the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the foregoing recitals and of the mutual promises, covenants, and conditions contained herein, the sufficiency of which is hereby acknowledged, City and Lessee agree as follows:

ARTICLE I. LEASED PREMISES

1. **PREMISES AND AIRCRAFT.** City leases to Lessee the T-Hangar unit located at the Airport and identified as 31501 Bryan Circle Unit B ("**Premises**"), for the sole purpose of storing one (1) aircraft bearing FAA registration number ("**N-number**") N36440 ("**Aircraft**"). The Aircraft shall be continuously registered with the Federal Aviation Administration ("**FAA**") throughout the term of this Lease. Lessee shall report any change in the Aircraft N-number to City in writing within fourteen (14) days of the change so that City may comply with applicable FAA reporting requirements.

2. **SUBJECT TO ENCUMBRANCES.** Lessee's tenancy is subject to all easements, rights of way, covenants, conditions, restrictions, reservations, and limitations of record, and to all applicable zoning and land use laws, ordinances, codes, and regulations, including all conditions, regulations, restrictions, and requirements imposed by the FAA governing the Premises and its use.

3. **ACCEPTANCE AS IS.** The Premises are leased "AS IS, WHERE IS, WITH ALL FAULTS." City makes no representation or warranty, express or implied, as to suitability, fitness for a particular purpose, title, zoning, physical or environmental condition, utilities, governmental approvals, or compliance of the Premises with any law or regulation. Lessee's taking of possession is conclusive evidence that Lessee accepts the Premises in their present condition.

ARTICLE II. TERM AND RENEWAL

4. INITIAL TERM. The initial term of this Lease shall be one (1) year, commencing on the Effective Date and ending at 11:59 p.m. on the day before the first anniversary of the Effective Date, unless earlier terminated as provided herein.

5. RENEWAL OPTIONS. Lessee shall have the option to renew this Lease for up to four (4) successive renewal terms of one (1) year each. To exercise a renewal option, Lessee shall provide written notice to the Director of Aviation no later than fifteen (15) days prior to the expiration of the initial term or renewal term then in effect. If Lessee fails to provide timely renewal notice, this Lease shall terminate at the expiration of the then-current term, and Lessee shall surrender possession in accordance with Section 46. Lessee's renewal option is contingent on Lessee not being in default of this Lease at the time of renewal notice and on Lessee having no uncured material breach during the initial term or any renewal term then in effect; the Director of Aviation shall determine in good faith whether this condition is satisfied. Renewal at the Rent then in effect under the Schedule of Rates and Charges shall not require further action by City Council, the parties having agreed to the renewal mechanism set forth in this Lease. In no event shall the aggregate term of this Lease, including the initial term and all renewal terms, exceed five (5) years.

6. EARLY TERMINATION. Either party may terminate this Lease, with or without cause, by providing the other party at least fourteen (14) days' prior written notice stating the date on which the Lease shall terminate.

ARTICLE III. RENT, TAXES, AND FEES

7. MONTHLY RENT. Lessee shall pay to City monthly rent in the amount established for the T-Hangar unit type comprising the Premises by the Schedule of Rates and Charges adopted by City Council, as the same may be amended from time to time ("**Rent**"). The Rent in effect on the Effective Date is two hundred sixty-five dollars ($265) per month. Rent is payable in advance without notice or demand on or before the tenth (10^{th}) day of each calendar month at the address designated by City. Rent includes all utilities furnished by City to the Premises. No utilities other than those furnished by City shall be provided or permitted at the Premises without the prior written approval of the Director of Aviation.

8. ADJUSTMENT OF RENT ON RENEWAL. The Rent shall remain fixed at the amount in effect on the Effective Date during the initial term and during any renewal term then in effect. If City Council adjusts the Rent applicable to the T-Hangar unit type comprising the Premises during the initial term or any renewal term, the adjusted Rent shall apply to any subsequent renewal term elected by Lessee under Section 5. City shall provide Lessee written notice of any adjustment to the Rent at least thirty (30) days before the expiration of the term in which the adjustment takes effect. The Rent shall not be subject to any automatic consumer price index escalation.

9. LATE CHARGE AND DEFAULT INTEREST. Rent not received by City on or before the tenth (10th) day of the month in which it is due shall be subject to a late charge of Twenty-Five Dollars ($25.00). Any Rent or other sum due under this Lease that remains unpaid thirty (30) days after the due date shall accrue interest at the rate of eight percent (8%) per annum,

calculated from the original due date until paid in full. Late charges and interest are in addition to, and not in lieu of, any other remedy available to City under this Lease or at law.

10. **TAXES AND POSSESSORY INTEREST.** Lessee shall promptly pay when due all taxes, fees, licenses, and other governmental charges assessed against or applicable to the Premises or Lessee's use thereof. Lessee acknowledges that Pueblo County assesses a possessory interest tax against lessees of municipal property and that such tax is the responsibility of Lessee. City is a tax-exempt entity and shall not be liable for any tax of Lessee. Lessee acknowledges that multiple taxes and costs are associated with owning and operating an aircraft, including the leasing of hangar space, and that all such taxes and costs shall be paid by Lessee whether or not Lessee was aware of them.

ARTICLE IV. USE OF PREMISES

11. **PERMITTED USE.** The Premises shall be used solely for the storage of the Aircraft and for the following incidental, non-commercial uses associated with such storage: (i) storage of aircraft parts, tools, and supplies belonging to Lessee and directly associated with the Aircraft; (ii) storage of one (1) operable personal vehicle owned by Lessee while Lessee is operating the Aircraft away from the Airport; (iii) preventive maintenance performed on the Aircraft by Lessee personally, to the extent authorized by 14 C.F.R. Part 43, Appendix A, paragraph (c); and (iv) such other incidental uses as the Director of Aviation may approve in writing. All other uses are prohibited.

12. **AERONAUTICAL USE REQUIRED.** All uses of the Premises shall be substantially aeronautical in nature. The Premises shall not be used for residential purposes, for any commercial operation, or for the storage of non-aeronautical personal property. The Premises shall not be used for the storage of automobiles, except as authorized by Section 11 herein. Failure to comply with this Section is a material breach of this Lease.

13. **MAINTENANCE BY OTHERS.** No person other than Lessee or a regular employee of Lessee may perform services on the Aircraft on the Premises beyond preventive maintenance as defined in 14 C.F.R. Part 43, Appendix A, paragraph (c). Any maintenance exceeding preventive maintenance shall be performed only by an authorized person at a location approved for such activity by the Director of Aviation.

14. **OPERATIONAL RESTRICTIONS.** Lessee shall comply with the following operational requirements: (i) hangar doors shall remain closed and locked except when the Premises are attended by Lessee; (ii) drive-through gates entering the Air Operations Area shall be kept closed and locked at all times except for ingress and egress; (iii) only automobiles belonging to owners of aircraft hangared on the Airport shall be permitted in the Air Operations Area; (iv) automobiles shall be parked in designated parking spaces or within the hangar; (v) no person or automobile shall go beyond the immediate vicinity of the Premises without the prior written consent of the Director of Aviation; (vi) Lessee shall provide drip pans of non-flammable material under the Aircraft to prevent damage to the floor; and (vii) mounting, hanging, suspending, or otherwise installing any item from the ceiling, support beams, or roofing structure of the hangar is prohibited.

15. **PROHIBITED MATERIALS.** No flammable liquids or hazardous materials shall be used or stored on the Premises, except for fuel contained in the Aircraft fuel tanks or in the tank of a properly parked stored automobile.

16. **LESSEE MAINTENANCE.** Lessee shall, at its own expense, keep the Premises neat, clean, safe, and orderly at all times, free of waste, rubbish, and debris, and shall provide for the sanitary handling and disposal of all trash, garbage, and refuse resulting from Lessee's activities at the Airport. No outside storage of parts, materials, equipment, inventory, or other property is permitted. Lessee is responsible for snow removal within five (5) feet of the hangar door.

ARTICLE V. INSURANCE; INDEMNIFICATION; RISK OF LOSS

17. **REQUIRED INSURANCE.** Lessee, at its sole cost and expense, shall procure and maintain in full force during the term of this Lease a policy of commercial general liability insurance with limits of not less than One Million Dollars ($1,000,000.00) per occurrence and Three Million Dollars ($3,000,000.00) in the aggregate. Coverage shall include, without limitation, legal liability for property damage, bodily injuries, and deaths of persons in connection with the operation, maintenance, or use of the Premises, including acts or omissions of Lessee. The policy shall name the City of Pueblo as an additional insured and loss payee. The policy shall provide that it cannot be canceled or materially altered by the insured or the insurance company unless thirty (30) days' prior written notice is given to City. Lessee shall furnish a certificate of insurance evidencing such coverage upon execution of this Lease and upon issuance or renewal of any such policy thereafter. Lessee shall notify the Director of Aviation in writing of any change, expiration, or non-renewal within two (2) weeks of such event.

18. **INDEMNIFICATION.** Lessee shall indemnify, defend, and hold harmless City and its officers, agents, representatives, and employees from and against any and all penalties, liability, or loss, including costs and reasonable attorney fees, resulting from claims or court action, whether civil, criminal, or in equity, arising directly or indirectly from: (i) the acts or omissions of Lessee, its agents, employees, contractors, or guests; (ii) any occurrence in, on, or about the Premises; (iii) any condition of the Premises or any equipment, appurtenance, or activity thereon; or (iv) any injury or damage caused or occasioned in connection with Lessee's use or occupancy of the Premises. Nothing in this Lease is intended to waive, limit, or otherwise affect any immunity or limitation of liability conferred upon City under federal or state law, including the Colorado Governmental Immunity Act, C.R.S. § 24-10-101 et seq., as amended.

19. **RISK OF LOSS.** Lessee assumes all risk of loss, damage, injury, and liability with respect to Lessee, Lessee's guests, the Aircraft, Lessee's improvements, and Lessee's personal property in or upon the Premises. City shall not be liable or responsible for any such loss, damage, or injury, regardless of cause, including the negligence of City, its officers, agents, or employees. Lessee shall not hold or attempt to hold City liable for any injury, including loss of life, to any person or for damage to any property while on the Premises or the Airport, irrespective of how such injury or damage may be caused or occasioned.

ARTICLE VI. RIGHTS AND PRIVILEGES OF LESSEE

20. EXCLUSIVE USE. Subject to the rights reserved to City herein, Lessee shall have the exclusive use of the Premises for the purpose of storing the Aircraft and for the incidental uses set forth in Section 11. Lessee shall not assign this Lease or sublet the Premises or any part thereof.

21. IMPROVEMENTS AND ALTERATIONS. Except as specifically authorized herein, Lessee shall not, without the prior written approval of the Director of Aviation, make improvements, modifications, revisions, signs, or other alterations to the Premises. All improvements, modifications, revisions, signs, and alterations shall be at Lessee's sole expense and shall be performed by trade professionals licensed, insured, and permitted to conduct business within the City of Pueblo. Upon expiration or termination of this Lease, Lessee shall remove all such improvements at no cost to City; provided, however, that City may, on a case-by-case basis, allow improvements to remain, in which case City shall not be liable to Lessee for the cost thereof.

22. NO ENCUMBRANCE. Lessee shall not, directly or indirectly, voluntarily or involuntarily, mortgage, pledge, hypothecate, or otherwise encumber, or permit to be encumbered, the Premises, the leasehold interest created by this Lease, or any portion thereof or interest therein, by deed of trust, mortgage, lien, security interest, or other encumbrance of any kind. Any encumbrance recorded or asserted in violation of this Section shall be void as against City and shall constitute a material default of this Lease. Lessee shall, at Lessee's sole cost and expense, take all action necessary to remove and release any such encumbrance within ten (10) days of written notice from City. City shall have no obligation to subordinate its fee interest in the Airport to any encumbrance asserted against the leasehold. City's mechanic's lien rights under the laws of the State of Colorado are unaffected by this Section.

23. INGRESS AND EGRESS. Lessee, its employees, and invitees shall have the right of ingress and egress between designated airport access points and the Premises over, upon, and through such streets and not others as may be designated by the Director of Aviation from time to time. Driveways from existing streets into the Premises shall be located as designated by the Director of Aviation.

ARTICLE VII. RIGHTS AND PRIVILEGES OF CITY

24. RESERVED RIGHTS. All rights not herein granted to Lessee are reserved to City.

25. RIGHT OF ENTRY AND INSPECTION. City shall have the full and unrestricted right to enter upon those portions of the Airport occupied by Lessee, and City, its agents, or representatives shall be permitted to inspect the Premises during regular business hours or upon twenty-four (24) hours' notice to Lessee. In the event of an emergency, City may enter the Premises without prior notice. Lessee shall not inhibit, obstruct, delay, or refuse to allow City's entry or inspection authorized under this Section, and any such inhibition, obstruction, delay, or refusal shall constitute a material default of this Lease and grounds for immediate termination under Article X.

26. **MAINTENANCE OF AIRPORT FACILITIES.** City reserves the right, but not the obligation, to maintain and keep in repair the landing areas of the Airport and all publicly owned facilities of the Airport. City shall not be obligated to Lessee for any failure to maintain or repair such areas or facilities.

27. **Construction and Operational Restrictions.** Lessee acknowledges that the Airport is a public-use facility, the operation of which may from time to time require the temporary restriction of Lessee's access to the Premises or otherwise inconvenience or interrupt Lessee's operations at the Airport. Such circumstances include, without limitation: (i) programs of construction, reconstruction, expansion, relocation, maintenance, and repair at and to the Airport undertaken by City to ensure that the Airport and its facilities are suitable for the volume and character of air traffic and flight activity; (ii) airshows and other aerial demonstrations conducted at or in the vicinity of the Airport; (iii) flight restrictions imposed by the Federal Aviation Administration in the proximity of the President, Vice President, or other federally protected parties; (iv) temporary flight restrictions over disaster or hazard areas; (v) military operations conducted at or in the vicinity of the Airport; and (vi) emergency response, public safety, or security operations. City shall provide Lessee with reasonable advance notice of any such restriction or activity when feasible, except where notice is impracticable, prohibited by federal authority, or would compromise the operation. Lessee waives any claim against City or its officers, agents, employees, contractors, subcontractors, and representatives for damages, rent abatement, or other consideration arising from any such restriction, inconvenience, or interruption, and Lessee's obligations under this Lease, including the obligation to pay Rent, shall continue without interruption.

28. **RESERVATION OF AIRSPACE.** There is hereby reserved to City, its successors, and assigns, for the use and benefit of the public, a right of flight for the passage of aircraft in the airspace above the surface of the Premises, together with the right to cause in such airspace such noise as may be inherent in the operation of aircraft, now known or hereafter used, for navigation of or flight in the air, using such airspace or landing at, taking off from, or operating at the Airport.

29. **RIGHT TO DEVELOP.** City reserves the right, without any obligation to do so, to develop, modify, change, improve, or abandon the Airport or any part thereof as City may determine in its sole discretion, at any time, regardless of the desires or views of Lessee, and without interference or hindrance from Lessee or liability to Lessee.

30. **CITY MAINTENANCE OBLIGATION.** City shall maintain the floor, walls, roof, and doors of the Premises, except that the cost of repair for any damage to the same caused by Lessee, its employees, agents, or invitees shall be borne solely by Lessee.

31. **NO LIABILITY FOR LESSEE PROPERTY.** All risk of loss or damage to the Aircraft and to other personal property of Lessee in or upon the Premises is assumed by Lessee. City shall not be liable or responsible for any loss or damage to such property regardless of cause, including the negligence of City, its officers, agents, or employees.

ARTICLE VIII. FAA AND FEDERAL COMPLIANCE

32. SUBORDINATION TO FEDERAL AGREEMENTS. This Lease and all the provisions hereof are subject to all rights the United States Government now has or may in the future have or acquire affecting the control, operation, regulation, re-entry upon, and taking over of the Airport, including the Premises.

33. NO EXCLUSIVE RIGHTS. Nothing herein shall be construed to grant or authorize the granting of an exclusive right within the meaning of 49 U.S.C. § 40103(e).

34. TITLE VI COVENANT. Lessee, for itself, its heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree, as a covenant running with the land, that: (i) no person on the grounds of race, color, or national origin shall be excluded from participation in, denied the benefits of, or otherwise subjected to discrimination in the use of the Premises; (ii) in the construction of any improvements on, over, or under the Premises and the furnishing of services thereon, no person on the grounds of race, color, or national origin shall be excluded from participation in, denied the benefits of, or otherwise subjected to discrimination; and (iii) Lessee shall use the Premises in compliance with all other requirements imposed by or pursuant to 49 C.F.R. Part 21, Nondiscrimination in Federally-Assisted Programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964, as said Regulations may be amended.

35. CONSTRUCTION AND USE OF FACILITIES. Lessee, as a part of the consideration hereof, does hereby covenant and agree, as a covenant running with the land, that in the event facilities are constructed, maintained, or otherwise operated on the Premises for a purpose for which a United States Department of Transportation program or activity is extended or for another purpose involving the provision of similar services or benefits, Lessee shall maintain and operate such facilities and services in compliance with all requirements imposed pursuant to 49 C.F.R. Part 21, as said Regulations may be amended.

36. GENERAL CIVIL RIGHTS COMPLIANCE. In all activities within the scope of the airport program, Lessee agrees to comply with pertinent statutes, Executive Orders, and rules identified in the Title VI List of Pertinent Nondiscrimination Acts and Authorities, as referenced in Section 37, to ensure that no person shall, on the grounds of race, color, national origin (including limited English proficiency), creed, sex (including sexual orientation and gender identity), age, or disability, be excluded from participating in any activity conducted with or benefiting from federal assistance. This Section is in addition to, and not in lieu of, the covenants set forth in Sections 34 and 35.

37. PERTINENT NONDISCRIMINATION AUTHORITIES.

During the performance of this Lease, Lessee, for itself, its assignees, and successors in interest, agrees to comply with the following nondiscrimination statutes and authorities, including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq.) (prohibits discrimination on the basis of race, color, or national origin);

- 49 C.F.R. Part 21 (Nondiscrimination in Federally-Assisted Programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964);
- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 et seq.), as amended (prohibits discrimination on the basis of disability), and 49 C.F.R. Part 27;
- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 et seq.) (prohibits discrimination on the basis of age);
- Titles II and III of the Americans with Disabilities Act of 1990 (42 U.S.C. §§ 12131–12189), as implemented by 49 C.F.R. Parts 37 and 38;
- 49 U.S.C. § 47123 (FAA nondiscrimination provision); and
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency.

ARTICLE IX. ENVIRONMENTAL PROVISIONS

38. HAZARDOUS MATERIALS DEFINED. For purposes of this Lease, "Hazardous Materials" means any hazardous or toxic substance, material, or waste regulated by any local government authority, the State of Colorado, or the United States government, including without limitation: (i) substances defined as "hazardous waste," "restricted hazardous waste," "hazardous substance," or "hazardous material" under any applicable federal, state, or local law or regulation ("Environmental Regulations"); (ii) asbestos-containing materials; (iii) PCBs; (iv) petroleum or petroleum-based products; and (v) lead.

39. ENVIRONMENTAL COMPLIANCE. Lessee shall comply with all Environmental Regulations applicable to Lessee and its use of the Premises. No activity shall be undertaken by Lessee, its guests, employees, agents, contractors, or subcontractors on, or any portion of, the Premises that would cause or permit: (i) the presence, use, generation, release, discharge, storage, or disposal of any Hazardous Material in, on, under, about, or from the Premises in violation of any Environmental Regulation; (ii) any portion of the Premises to become a hazardous waste treatment, storage, or disposal facility without proper governmental authorization and compliance with all Environmental Regulations; or (iii) the discharge of pollutants or effluents into any water source or system, or the discharge into the air of any emissions, without proper governmental authorization and compliance with all Environmental Regulations, including the Federal Water Pollution Control Act, 33 U.S.C. § 1251 et seq., and the Clean Air Act, 42 U.S.C. § 7401 et seq.

40. ENVIRONMENTAL INDEMNITY. Lessee shall defend, indemnify, and forever hold harmless City and its officers, employees, agents, successors, and assigns from all claims, losses, damages, penalties, expenses, and costs, including reasonable attorney fees, characterization, remediation, and cleanup costs, incurred by reason of the use, storage, generation, release, discharge, maintenance, disposal, or removal of Hazardous Materials in, on, under, about, or from the Premises by Lessee, its employees, agents, guests, contractors, or subcontractors.

ARTICLE X. DEFAULT, REMEDIES, AND TERMINATION

41. EVENTS OF DEFAULT. Each of the following constitutes an event of default under this Lease: (i) failure of Lessee to pay any Rent, fee, or other sum due under this Lease when due; (ii) failure of Lessee to perform any other obligation under this Lease; (iii) violation by Lessee of any airport security rule, now or hereafter in effect; (iv) the declaration of insolvency or bankruptcy of Lessee, the assignment of Lessee's property for the benefit of creditors, the levy upon or seizure of Lessee's leasehold interest by writ of any court of law, or the appointment of a Trustee in Bankruptcy or Receiver for the property of Lessee; (v) abandonment of the Premises; (vi) inhibition, obstruction, delay, or refusal by Lessee of City's entry or inspection authorized under Section 25; (vii) assignment of this Lease in violation of Section 20; (viii) subletting of the Premises in violation of Section 20; or (ix) any encumbrance of the Premises or the leasehold interest in violation of Section 22.

42. TERMINATION ON DEFAULT. Upon the occurrence of an event of default in payment, or any breach of the covenants or agreements herein, City may declare this Lease terminated, and after the expiration of fourteen (14) days from the date of service of a written notice of termination, City shall be entitled to possession of the Premises. Upon the occurrence of an event of default related to insolvency or bankruptcy under Section 41(iv), City may, at its option, immediately terminate this Lease and retake possession of the Premises with or without notice, notice being expressly waived, without working any forfeiture of any accrued obligations of Lessee. Violation of airport security rules, interference with City's right of entry or inspection under Section 25, or any breach of Section 20 (assignment or subletting) or Section 22 (encumbrance), shall be grounds for immediate termination of this Lease.

43. REMEDIES ON DEFAULT. If, after notice of termination as provided herein, Lessee shall refuse to surrender and deliver possession of the Premises, City may, without further notice or demand, enter upon and take possession of the Premises, expel and remove Lessee, using such help, assistance, and force as may be needful and proper, without prejudice to any remedy allowed by law. If the Premises are left vacant and any Rent reserved remains unpaid, City may, without obligation to do so and without terminating this Lease, retake possession of the Premises and re-let the same for such rent and upon such conditions as City deems best, making such changes and repairs as may be required, giving credit for the amount of rent so received less all expenses of such changes and repairs, and Lessee shall be liable for the balance of the Rent reserved until the expiration of this Lease.

44. CITY'S LIEN. In the event this Lease is terminated as herein provided, City shall have, and Lessee hereby grants, a lien upon Lessee's equipment, fixtures, furniture, and inventory in or upon the Premises for all Rent, expenses, attorney fees, and costs then due or to become payable by Lessee. Such lien may be enforced by the taking and sale of such property in the manner provided for the disposition of collateral under the Colorado Uniform Commercial Code.

45. HOLDOVER. If, after the expiration of the term of this Lease, Lessee remains in possession of the Premises and continues to pay Rent without any express written agreement as to such holding over, Lessee shall be a month-to-month tenant subject to all terms and covenants of

this Lease, except that during the term of any month-to-month tenancy, City or Lessee may terminate this Lease upon fourteen (14) days' prior written notice.

46. SURRENDER OF PREMISES. Without affecting any other right granted to City under this Lease, Lessee shall remove the Aircraft and any personal property from the Premises within seven (7) days after termination of this Lease. Should Lessee fail to remove such property within that seven-day period, City shall have the right to enter and remove the property, and Lessee shall be liable for all costs of removal. Unclaimed property shall be deemed abandoned and may be disposed of in any manner City deems appropriate. Should City sell the abandoned property, the proceeds shall first be applied to costs due to City, and any remaining amount shall be forwarded to Lessee.

47. ATTORNEY FEES. Lessee shall pay City all costs, including reasonable attorney fees, incurred by City in recovering any Rent or other money due and unpaid or in recovering possession of the Premises after termination of this Lease.

ARTICLE XI. NOTICES

48. NOTICE REQUIREMENTS. Any notice, demand, or request provided in this Lease shall be in writing and given by either: (i) certified mail, return receipt requested, to the address of the receiving party as follows:

To City:	To Lessee:
Director of Aviation 31201 Bryan Circle Pueblo, CO 81001	Daniel J. Ramos 510 Floyd Lane Pueblo, CO 81005 DJR469@HOTMAIL.COM

or, (ii) electronic mail, transmitted to the email address designated by the receiving party with a copy concurrently sent by certified mail, return receipt requested. Notice shall be deemed given on the date of mailing for certified mail, or, if delivered by electronic mail, on the date of confirmed transmission, provided that the required certified mail copy is also sent on or before the next business day.

ARTICLE XII. GENERAL CONDITIONS

49. SUBORDINATION TO CODE, RULES, AND REGULATIONS. The terms and conditions of this Lease and Lessee's rights hereunder are subject to the provisions of the Pueblo Municipal Code ("**PMC**"), as the same may be subsequently amended, including without limitation Title III thereof relating to the Department of Aviation, and to the Airport Rules and Regulations adopted by the Director of Aviation, as amended from time to time. In the event of conflict between the PMC and this Lease, the PMC shall control. Lessee shall observe faithfully all rules and regulations affecting use of the Airport, whether established by the Director of Aviation, the City, or other political subdivision having jurisdiction, the State of Colorado, or the United States, or agencies thereof, including rules affecting the operation of motor vehicles upon, to, and from the Airport. Lessee, and all officers, agents, and employees of

Lessee, agree to be bound by and subject to all police ordinances of the City of Pueblo at all times while on the Airport.

50. **NON-INTERFERENCE WITH AIRCRAFT OPERATIONS.** Lessee, by accepting this Lease, expressly agrees for itself, its successors, and assigns that it shall not make use of the Premises in any manner that might interfere with the landing and taking off of aircraft from the Airport or otherwise constitute a hazard. In the event the foregoing covenant is breached, City reserves the right to enter upon the Premises and cause the abatement of such interference at the expense of Lessee.

51. **GOVERNING LAW AND VENUE.** This Lease shall be governed by and construed in accordance with the laws of the State of Colorado. Venue for any action arising under or for the enforcement of this Lease shall lie exclusively in a state court of competent jurisdiction located in Pueblo County, Colorado.

52. **NO THIRD-PARTY BENEFICIARIES.** Nothing in this Lease is intended, nor shall it be construed, to create any rights, claims, or benefits in any third party, or to assume any liability for or on behalf of any third party, or to waive any immunities or limitations conferred upon City under federal or state law, including the Colorado Governmental Immunity Act, C.R.S. § 24-10-101 et seq.

53. **NO PARTNERSHIP OR JOINT VENTURE.** Nothing in this Lease is intended to, nor shall be deemed to, constitute a partnership or joint venture between the parties, or to create any agency or partner relationship between the parties. Neither party shall hold itself out as a partner, joint venturer, agent, or representative of the other under this Lease.

54. **SUCCESSORS AND ASSIGNS.** All covenants and agreements in this Lease shall be binding upon and inure to the benefit of the heirs, successors, assigns, and legal representatives of City and Lessee, subject to the restrictions on assignment and subletting set forth herein.

55. **SEVERABILITY.** If any provision of this Lease is held by a court of competent jurisdiction to be invalid, illegal, or unenforceable, the remainder of this Lease shall remain in full force and effect, and the invalid, illegal, or unenforceable provision shall be deemed modified to the minimum extent necessary to render it enforceable while preserving the intent of the parties to the maximum extent possible.

56. **INTEGRATION.** This Lease constitutes the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior negotiations, representations, and agreements, whether written or oral. This Lease may be amended only by a written instrument signed by both parties and approved by City Council where such approval is required by law.

57. **NO WAIVER.** No assent, express or implied, to any breach of any covenant or agreement of this Lease shall be deemed or taken to be a waiver of any succeeding or other breach. No failure or delay by City in exercising any right under this Lease shall operate as a waiver of such right.

58. **CAPTIONS.** The captions and headings used in this Lease are for convenience of reference only and shall not be used to construe or interpret any provision of this Lease.

59. COUNTERPARTS AND ELECTRONIC EXECUTION. This Lease may be executed in counterparts, each of which shall be deemed an original, and all of which together shall constitute one and the same instrument. The parties may execute this Lease by electronic signature, and any such electronic signature shall be deemed an original signature for all purposes.

60. SURVIVAL. All obligations of Lessee that by their nature are intended to survive termination of this Lease, including without limitation the indemnity obligations under Sections 18 and 40, the environmental obligations under Article IX, the surrender obligations under Section 46, and the attorney fee obligation under Section 47, shall survive termination of this Lease.

Executed at Pueblo, Colorado, the day and year first above written.

LESSEE:

_____

Daniel J. Ramos

CITY:

City of Pueblo, A Municipal Corporation

By: _____

Mayor

ATTEST:

By: _____

City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Beritt Odom, Director Planning and Community Development

SUBJECT: AN ORDINANCE AUTHORIZING THE CITY OF PUEBLO TO GRANT A CONDITIONAL WAIVER OF FEES RELATING TO WASTEWATER CONNECTION FEES TOTALING A MAXIMUM OF $236,170 FOR PHASE II OF THE PUEBLO SPRINGS APARTMENTS LOCATED IN THE SOUTHEAST CORNER OF THE PUEBLO SPRINGS APARTMENTS SUBDIVISION

SUMMARY:

Attached is a proposed Ordinance authorizing the City of Pueblo to grant a conditional waiver of fees for wastewater connection fees totaling up to $236,170 requested by the developer of the Pueblo Springs Apartments, Phase II.

PREVIOUS COUNCIL ACTION:

In July 2020, Council approved Resolution No. 14433 granting a conditional fee waiver totaling up to $317,020 requested by the developer of Pueblo Springs Apartments for Phase I of this project. In December 2021, Council approved Resolution N. 14768 granting a twelve-month extension on the previous waiver and authorizing an additional estimated $60,000 in waived development fees. In June 2023, Council approved Resolution No. 15258 granting an additional extension and an increase in waived fees up to a maximum amount of $653,400. In February 2024, Council approved Resolution No. 15507 granting an additional extension

BACKGROUND:

Pueblo Springs Apartments Phase II is a proposed 113-unit apartment complex to be constructed on Lot 2, Block 1, Pueblo Springs Apartments Subdivision, which is located in the southeast corner of the Pueblo Springs Apartments Subdivision. The project will provide housing for new and existing residents of the City. As an incentive to reduce the overall costs of construction of this project, the waiver of fees for the wastewater connection has been requested by the developer.
Under the attached proposed Ordinance, the waiver of the Wastewater fees will expire

on May 25, 2027, unless on or before that date, the developer provides satisfactory proof of the following:

1. With respect to Pueblo Springs Apartments 4.75-acre complex, successful completion of the following milestones:

a. Rezoning of the property.

b. City of Pueblo Building Permit approval for the Pueblo Springs Apartments, Phase II, which includes multifamily residential structures containing 113 dwelling units and associated accessory structures.

FINANCIAL IMPLICATIONS:

The Wastewater will not receive connection fees for this project as follows:

Fee Type	Amount
Sanitary Sewer Connection Fee	$236,170
Total	$236,170

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

Failure to approve this Ordinance will likely significantly delay or make Phase II Pueblo Springs Apartments Project financially unfeasible.

RECOMMENDATION:

Approve the Ordinance.

ATTACHMENTS:

None

ORDINANCE NO.

AN ORDINANCE AUTHORIZING THE CITY OF PUEBLO TO GRANT A CONDITIONAL WAIVER OF FEES RELATING TO WASTEWATER CONNECTION FEES TOTALING A MAXIMUM OF $236,170 FOR PHASE II OF THE PUEBLO SPRINGS APARTMENTS LOCATED IN THE SOUTHEAST CORNER OF THE PUEBLO SPRINGS APARTMENTS SUBDIVISION

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The City of Pueblo, acting by and through its Wastewater Enterprise, hereby grants a waiver of Wastewater sanitary sewer connection fees up to a maximum amount of $236,170 to the Pueblo Springs Apartments, located in the southeast corner of the Pueblo Springs Apartments Subdivision.

SECTION 2.

The waiver of Wastewater fees as provided in this Resolution will expire on May 25, 2027, unless on or before that date, Pueblo Springs Apartments provides the City with satisfactory proof of the following:

1. With respect to Pueblo Springs Apartments 4.75-acre complex, successful completion of the following milestones:

    a. Rezoning of the property.

b. Southern Colorado Regional Building Permit approval for the Pueblo Springs Apartments, Phase II, which includes multifamily residential structures containing 113 dwelling units and associated accessory structures.

SECTION 3.

Pueblo Springs Apartments shall not begin construction of improvements on its 4.75-acre property until the satisfaction of the conditions set forth in Section 2 of this Ordinance.

SECTION 4.

The May 25, 2027, deadline, specified in Section 2, shall be extended as follows, upon the occurrence of the following event:

a. If the U.S. Department of Housing and Urban Development or a conventional lender does not approve the financing for Pueblo Springs Apartments Phase II by May 25, 2027, the deadline shall be extended for an additional six (6) months.

SECTION 5.

This Ordinance shall not serve as a precedent for the granting of waivers of Wastewater fees in the future. The decision to grant a waiver of wastewater connection fees to Phase II, Pueblo Springs Apartments was based on the particular facts surrounding the Pueblo Springs Apartments development and a rational assessment of the benefits to the City.

SECTION 6.

The officers of the City are authorized and directed to perform any and all acts consistent with the intent of this Ordinance to effectuate the policies and procedures described herein.

SECTION 7.

This Ordinance shall become effective immediately upon final passage.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____
_____
_____
_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor’s veto.

President of City Council

ATTEST

City Clerk

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Beritt Odom, Director Planning and Community Development

SUBJECT: AN ORDINANCE ACCEPTING, APPROVING AND AUTHORIZING THE MAYOR TO EXECUTE LPC-24-055 PUEBLO AFFORDABLE HOUSING PROCEDURE UPDATES STATE OF COLORADO GRANT AGREEMENT MODIFICATION, GRANT AGREEMENT AMENDMENT #1., AND BUDGETING AND APPROPRIATING INCENTIVE FUNDS IN THE AMOUNT OF $50,000 INTO PL2402

SUMMARY:

This Ordinance budgets and appropriates additional incentive funds in the amount of $50,000, which was awarded by the State of Colorado Department of Local Affairs (DOLA) for adopting an Expedited Review Process for affordable housing. This Ordinance also amends the LPC-24-055 Pueblo-Affordable Housing Procedure Updates Grant work description to include funding for professional development; hiring a temporary staff person in the Planning and Community Development Department to research and draft the required Strategic Growth Element for the Pueblo Regional Comprehensive Plan; and hiring a full-time Housing and Citizen Service Coordinator Position to launch a new program addressing vacant and blighted housing stock.

PREVIOUS COUNCIL ACTION:

Ordinance No. 10862 establishing the Pueblo Affordable Housing Procedures Updates, Project No. PL2402, was originally approved on December 23, 2024. The Ordinance budgeted and appropriated $24,000 in matching funds for the Project.

Ordinance No. 11013, approved on August 11, 2025, updated Project No. PL2402 by budgeting and appropriating additional funds in the amount of $96,000 from the State of Colorado Department of Local Affairs LPC-24-055, Pueblo Affordable Housing Procedure Updates.

BACKGROUND:

The Planning and Community Development Department developed and approved an Expedited Review Process for Affordable Housing Projects as part of the City's Commitment to participate in Proposition 123, Resolution No. 16202, December 22, 2025. The intent of the City's participation in Proposition 123 is to increase affordable housing within the City of Pueblo. The Colorado Department of Local Affairs awarded the City an additional $50,000 in grant funding to be included in the LPC-24-055-Pueblo Affordable Housing Procedure Updates Grant award for completing the Expedited Review Process for Affordable Housing. A portion of the additional grant funds from DOLA will be used by the Planning and Community Development Department for professional development related to affordable housing; and to hire one temporary staff person to research and draft an update to the Pueblo Regional Comprehensive Plan in accordance with the State Sustainable Affordable Housing Assistance (SB24-174). The proposed Strategic Growth Element comprehensive plan additions are intended to guide the adoption of local policies related to affordable housing and incentivize affordable housing development. This Ordinance also amends the approved LPC-24-055 Grant Agreement Work Plan to facilitate hiring a full-time Housing and Citizen Service Coordinator to launch a program addressing vacant or blighted housing stock and managing renovation or redevelopment of these homes.

FINANCIAL IMPLICATIONS:

The Project budget, PL2402 will be funded through the following sources:	
DOLA LPC-24-055 State of Colorado Grant Agreement Modification, Grant Agreement #1	$50,000
DOLA LPC-24-055 Affordable Housing Procedure Updates (Ordinance NO. 11013)	$96,000
City of Pueblo Matching Funds (Ordinance NO 10862)	$24,000
Total:	$170,000

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If the funding and Grant Agreement are not approved, the affordable housing projects will not move forward.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

1. LPC-24-055 CA #1

ORDINANCE NO.

AN ORDINANCE ACCEPTING, APPROVING AND AUTHORIZING THE MAYOR TO EXECUTE LPC-24-055 PUEBLO AFFORDABLE HOUSING PROCEDURE UPDATES STATE OF COLORADO GRANT AGREEMENT MODIFICATION, GRANT AGREEMENT AMENDMENT #1., AND BUDGETING AND APPROPRIATING INCENTIVE FUNDS IN THE AMOUNT OF $50,000 INTO PL2402

WHEREAS, the State of Colorado Department of Local Affairs has awarded incentive funds through LPC-24-055 Pueblo-Affordable Housing Procedure Updates, State of Colorado Grant Agreement Modification, Grant Agreement Amendment #1 to the City of Pueblo; NOW THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The Incentive Fund Award, LPC-24-055 Affordable Housing Procedure Updates, State of Colorado Grant Agreement Modification, Grant Agreement Amendment #1 in the amount of $50,000 are hereby budgeted and appropriated for the LPC-24-055 Affordable Housing Procedures Updates, Project No. PL2402.

SECTION 2.

The State of Colorado Grant Agreement Modification, Grant Agreement Amendment #1, having been approved by the City Attorney, is hereby approved

SECTION 3.

The Mayor is authorized to execute and deliver the LPC-24-055 Affordable Housing Procedure Updates, State of Colorado Grant Agreement Modification, Grant Agreement Amendment #1 in the name of the City and the City Clerk is directed to affix the seal of the City thereto and attest same.

SECTION 4.

The Mayor is authorized to perform any and all acts consistent with the intent of this Ordinance, the Incentive Award, Amendment #1, to implement the policies and procedures described therein including without limitation authorization of payments pursuant to and subject to the requirements of Amendment #1.

SECTION 5.

This Ordinance shall become effective immediately upon final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____
_____
_____
_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

State of Colorado Grant Agreement Modification

Grant Agreement Amendment #1

State Agency

Department of Local Affairs (DOLA)

Grantee

City of Pueblo

Project Number and Name

LPC-24-055 - Pueblo - Affordable Housing Procedure Updates

Amendment CMS Number

206870

Previous CMS #(s)

195418

Program Name

Local Planning Capacity Grant Program

( )

Funding Account Codes

Phase Code

DLG Portal Number

LPC-24-055

Current Grant Agreement Expiration Date

May 31, 2028

Prior Grant Agreement Expiration Date

January 31, 2027

Grant Amount

Initial Award:	$96,000.00
Amendment#1 05/05/2026:	$50,000.00
Total Grant Amount:	**$146,000.00**

DOLA Program Manager

Robyn DiFalco, (720) 682-5202, (robyn.difalco@state.co.us)

DOLA Program Assistant

Jessica Rupe, (720) 557-4902, (jessica.rupe@state.co.us)

The Parties hereto have executed this amendment

Each person signing this Amendment represents and warrants that the signer is duly authorized to execute this Amendment and to bind the Party authorizing such signature.

Grantee
CITY OF PUEBLO

_____

By: Name of Authorized Individual

_____

Title: Official Title of Authorized Individual

_____

*Signature

Date: _____

STATE OF COLORADO
Jared S. Polis, Governor
Colorado Department of Local Affairs
Maria De Cambra, Executive Director

_____

By: Maria De Cambra, Executive Director

Date: _____

STATE OF COLORADO
PRE-APPROVED FORM REVIEWER

_____

By: Robyn DiFalco, LPC Program Manager

Date: _____

STATE CONTROLLER

Robert Jaros, CPA, MBA, JD

_____

By: Kelly Bearden, DOLA Controller Delegate

Amendment Effective Date: _____

In accordance with §24-30-202, C.R.S., this Amendment is not valid until signed and dated below by the State Controller or an authorized delegate.

1. Parties

This Grant Agreement Amendment (the "Amendment") to the Original Grant Agreement (the "Agreement") shown on the Signature and Cover Page for this Amendment is entered into by and between the Grantee, and the State.

2. Terminology

Except as specifically modified by the Amendment, all terms used in this Amendment that are defined in the Agreement shall be construed and interpreted in accordance with the Agreement.

3. Amendment Effective Date and Term

A. Amendment Effective Date

This Amendment shall not be valid or enforceable until the Amendment Effective Date shown on the Signature and Cover Page for this Amendment. The State shall not be bound by any provision of this Amendment before that Amendment Effective Date, and shall have no obligation to pay Grantee for any Work performed or expense incurred under this Amendment either before or after the Amendment term shown in **§3.B** of this Amendment.

B. Amendment Term

The Parties' respective performances under this Amendment and the changes to the Agreement contained herein shall commence on the Amendment Effective Date shown on the Signature and Cover Page for this Amendment or May 05, 2026, whichever is later and shall terminate on the termination of the Agreement.

4. Purpose

The Parties entered into the Agreement to hire qualified consultants to facilitate updates to policies and procedures that incentivize or reduce barriers to affordable housing. Grantee requested and received Supplemental Grant Funds in the amount of $50,000 for achieving the Proposition 123 milestone for early adoption of Fast Track. Grantee requests the Scope of Project be modified to include amending the City's Comprehensive Plan to create a Strategic Growth Element and using incentive funds to hire new personnel and funding for professional development; the budget table be adjusted to account for the revised Scope of Work and incentive funding; the quarterly reporting cadence changed to monthly reporting; and the Grant Agreement Expiration Date be extended. This Amendment modifies the Agreement as requested.

5. Modification

The Agreement and all prior amendments thereto, if any, are modified as follows:

A. The Agreement Initial Agreement Expiration Date on the Agreement's Signature and Cover Page is hereby deleted and replaced with the Current Agreement Expiration Date shown on the Signature and Cover Page for this Amendment.

B. The Agreement Maximum Amount field on the Agreement's Signature and Cover Page is hereby deleted and replaced with the Current Agreement Maximum Amount field shown on the Signature and Cover Page for this Amendment.

C. The Project Description on the Agreement's Signature and Cover Page and **Section 2. Description of the Project(s) and Work, §2.1. Project Description** in **Exhibit B** is hereby deleted:

"The Project consists of amending the City of Pueblo's land use codes and comprehensive plan to incentivize affordable housing development, implementing process improvements to expedite the development review process for affordable housing projects, and generally advancing affordable housing goals in Pueblo, Colorado."

and is replaced with the following in lieu thereof:

"The Project consists of amending the City of Pueblo's land use codes to incentivize affordable housing development **and amending the city's Comprehensive Plan to create a strategic growth element**, **hiring new personnel, funding for professional development,** and generally advancing affordable housing goals in Pueblo, Colorado."

D. The first paragraph in **Section 2. Description of the Project(s) and Work, §2.2. Work Description**. in **Exhibit B** is hereby deleted:

"The City of Pueblo (Grantee) will hire qualified consultants to facilitate updates to policies and procedures that incentivize or reduce barriers to affordable housing. Work includes: 1) adoption/implementation of amendments to the Grantee's land use codes and comprehensive plan; 2) process improvements to streamline the development review process including exploration of software solutions for tracking and expedited review; and 3) tracking/documentation of Prop 123 efforts such as local government commitments and fast track compliance. Grantee will complete quarterly performance metric reporting in a form provided by DOLA."

and is replaced with the following in lieu thereof:

"The City of Pueblo (Grantee) will hire qualified consultants to facilitate **strategic policy recommendations** that incentivize or reduce barriers to affordable housing **development**.

The Project also includes funding for professional development expenses and hiring a full-time Housing and Citizen Service Coordinator to launch a new program addressing vacant or blighted housing stock and managing renovation or redevelopment of these homes. The Project funds 100% of the salary and benefits for this position for approximately one (1) year after the effective date of this Agreement. During the Agreement period and prior to Project Closeout, the Grantee will provide DOLA with plans for maintaining the position into the future. The Housing and Citizen Service Coordinator will dedicate 100% of their time and effort to implementation of this new program and Grant Funds will cover 86% of the salary and benefits for this position. The City will also hire a term-limited employee to prepare a Strategic Growth Element as an amendment to the City's Comprehensive Plan to comply with SB24-174 (C.R.S. 31-23-206(1.5)(d). Grant Funds will reimburse 86% of this term-limited employee's time and effort for approximately six (6) months after the Effective Date of this Agreement. Grantee will conduct a robust community engagement process that ensures participation by all key stakeholders, especially underrepresented voices, and residents or local workers who are considered housing cost-burdened. Grantee will complete **monthly** performance metric reporting in a form provided by DOLA."

E. The sentence in **Section 2. Description of the Project(s) and Work, §2.5. Eligible Expenses**. in **Exhibit B** is hereby deleted:

"Eligible expenses shall include: consultant fees, RFP/bid advertisements, and attorney's fees."

and is replaced with the following in lieu thereof:

"Eligible expenses shall include: consultant fees, RFP/bid advertisements, attorney's fees, **program-specific allowable salary and benefits costs, enrollment costs, and** Direct costs."

F. The following Subsection is hereby deleted from **§3.1. Project Budget Lines** in **Section 3. Definitions** in **Exhibit B:**

3.1.2. "Personnel Services Costs" means program-specific allowable salary and benefits costs.

3.1.3 "Other Costs" means enrollment costs.

G. The first sentence in **§4.1. Outcome** in **Section 4. Deliverables** in **Exhibit B** is hereby deleted:

"The final outcome of this Grant is submission of any Grant-related reports or work product funded by this award, documentation from community engagement outcomes, implementation of a system to expedite the development review process for affordable housing projects, and efforts to achieve Proposition 123 requirements in Pueblo, Colorado. In addition, a Final Informal Memo will be submitted to DOLA as a Final Report."

and is replaced with the following in lieu thereof:

"The final outcome of this Grant is **the provision of funding for new personnel, a plan to retain the position into the future, completion of the Strategic Growth Element,** submission of any Grant-related reports or Work product funded by this award, documentation from community engagement outcomes, implementation of **an effective** system to expedite the development review process for affordable housing projects, and **related** efforts to achieve Proposition 123 requirements in Pueblo, Colorado. In addition, a Final Informal Memo will be submitted to DOLA as a Final Report."

H. The following milestones in **§4.3. Performance Measures** in **Section 4. Deliverables** in **Exhibit B** are hereby deleted:

Documentation of new policy adoption, and/or efforts to explore, adopt, or implement policies that expedite review of affordable housing.	Within 30 days after the Policy adoption.
Submit draft policy documents and/or expedited review policy language to DOLA for courtesy review.	30 days prior to a scheduled public hearing.
Submit Quarterly Pay Requests	See §4.5.2 below
Submit Quarterly Status Reports	See §4.5.2 below
Submit Project Final Report	May 01, 2027

and are replaced with the following in lieu thereof:

Begin recruitment and hiring process.	Within 3 months after execution of this Amendment.
Provide DOLA a copy of Job Description for an employee that will be paid with Grant Funds.	At least seven (7) days before employee begins Grant-related activities
Documentation of new policy adoption.	Within 30 days after

	the formal adoption.
Submit draft policy documents to DOLA for courtesy review.	Within 30 days prior to a scheduled public hearing.
Submit **Monthly** Pay Requests	See §4.5.2 below
Submit **Monthly** Status Reports	See §4.5.2 below
Submit Project Final Report	**August 29, 2028**

I. **Subsection 4.5. Quarterly Pay Request and Status Reports in Section 4. Deliverables in Exhibit B is hereby deleted:**

"Quarterly Pay Request and Status Reports. Beginning 30 days after the end of the first quarter following execution of this Grant and for each quarter thereafter until termination of this Grant, Grantee shall submit Pay Requests and Status Reports using a form provided by the State. The State shall pay the Grantee for actual expenditures made in the performance of this Grant based on the submission of statements in the format prescribed by the State. The Grantee shall submit Pay Requests setting forth a detailed description and provide documentation of the amounts and types of reimbursable expenses. Pay Requests and Status Reports are due within 30 days of the end of the quarter but may be submitted more frequently at the discretion of the Grantee."

and is replaced with the following in lieu thereof:

"**Monthly Pay Request and Status Reports**. Beginning 30 days after the end of the first month following execution of this Grant and for each month thereafter until termination of this Grant, Grantee shall submit Pay Requests and Status Reports using a form provided by the State. The State shall pay the Grantee for actual expenditures made in the performance of this Grant based on the submission of statements in the format prescribed by the State. The Grantee shall submit Pay Requests setting forth a detailed description and provide documentation of the amounts and types of reimbursable expenses. Pay Requests and Status Reports are due within 30 days of the end of the month but may be submitted more frequently at the discretion of the Grantee."

J. **Subsection 4.5.1 in Section 4. Deliverables in Exhibit B is hereby deleted:**

"For quarters in which there are no expenditures to reimburse, Grantee shall indicate zero (0) requested in the Pay Request and describe the status of the Work in the Status Report. The report will contain an update of expenditure of funds by budget line as per §6.2 of this Exhibit B Scope of Project as well as a projection of all Work expected to be

accomplished in the following quarter, including an estimate of Grant Funds to be expended."

and is replaced with the following in lieu thereof:

"For **months** in which there are no expenditures to reimburse, Grantee shall indicate zero (0) requested in the Pay Request and describe the status of the Work in the Status Report. The report will contain an update of expenditure of funds by budget line as per §6.2 of this Exhibit B Scope of Project as well as a projection of all Work expected to be accomplished in the following month, including an estimate of Grant Funds to be expended."

K. The table in **§4.5.2. Specific Submittal Dates** in **Section 4. Deliverables** in **Exhibit B is hereby deleted:**

Month	Year	Due Date	Pay Request Due	Status Report Due
4th (Oct-Dec)	2024	January 30, 2025	Yes	Yes
1st (Jan-Mar)	2025	April 30, 2025	Yes	Yes
2nd (Apr-Jun)	2025	JULY 15, 2025*	Yes	Yes
3rd (Jul-Sep)	2025	October 30, 2025	Yes	Yes
4th (Oct-Dec)	2025	January 30, 2026	Yes	Yes
1st (Jan-Mar)	2026	April 30, 2026	Yes	Yes
2nd (Apr-Jun)	2026	JULY 15, 2026*	Yes	Yes
3rd (Jul-Sep)	2026	October 30, 2026	Yes	Yes
4th (Oct-Dec)	2026	January 30, 2027	Yes	Yes
1st (Jan-Mar)	2027	April 30, 2027	Yes	Yes

and is replaced with the following in lieu thereof:

Month	Year	Due Date	Pay Request Due	Status Report Due
4th (Oct-Dec)	2024	January 30, 2025	Yes	Yes
1st (Jan-Mar)	2025	April 30, 2025	Yes	Yes
2nd (Apr-Jun)	2025	JULY 15, 2025*	Yes	Yes
3rd (Jul-Sep)	2025	October 30, 2025	Yes	Yes
4th (Oct-Dec)	2025	January 30, 2026	Yes	Yes

1st (Jan-Mar)	2026	April 30, 2026	Yes	Yes
2nd (Apr-Jun)	2026	JULY 15, 2026*	Yes	Yes
3rd (Jul-Sep)	2026	October 30, 2026	Yes	Yes
4th (Oct-Dec)	2026	January 30, 2027	Yes	Yes
1st (Jan-Mar)	2027	April 30, 2027	Yes	Yes
Month	Year	Due Date	Pay Request Due	Status Report Due
February	2027	March 30, 2027	Yes	Yes
March	2027	April 30, 2027	Yes	Yes
April	2027	May 30, 2027	Yes	Yes
May	2027	June 30, 2027	Yes	Yes
June	2027	JULY 15, 2027*	Yes	Yes
July	2027	August 30, 2027	Yes	Yes
August	2027	September 30, 2027	Yes	Yes
September	2027	October 30, 2027	Yes	Yes
October	2027	November 30, 2027	Yes	Yes
November	2027	December 30, 2027	Yes	Yes
December	2027	January 30, 2028	Yes	Yes
January	2028	March 2, 2028	Yes	Yes
February	2028	March 30, 2028	Yes	Yes
March	2028	April 30, 2028	Yes	Yes
April	2028	May 30, 2028	Yes	Yes
May	2028	June 30, 2028	Yes	Yes

L. The personnel in **§5.1. Responsible Administrator** in **Section 5. Personnel** in **Exhibit B** is hereby deleted:

"Scott Hobson, Director of Planning and Community Development, (shobson@pueblo.us)"

and is replaced with the following in lieu thereof:

"**Beritt Odom, Planning Director, (bodom@pueblo.us)**"

M. The table in **§6.2. Budget** in **Section 6. Funding** in **Exhibit B** is hereby deleted:

Budget Line(s)		Total Project Cost	Grant Funds	Other Funds	Other Funds Source
Line #	Cost Category				
1	Consultant Services	$120,000	$96,000	$24,000	Grantee
	Total	**$120,000**	**$96,000**	**$24,000**	

and is replaced with the following in lieu thereof:

Budget Line(s)		Total Project Cost	Grant Funds	Other Funds	Other Funds Source
Line #	Cost Category				
1	Consultant Services	$30,000	$25,765	$4,235	Grantee
2	Personnel Services – **CA #1**	$120,000	$103,065	$16,935	Grantee
3	Other: Enrollment costs – **CA #1**	$20,000	$17,170	$2,830	Grantee
	Total	**$170,000**	**$146,000**	**$24,000**	

N. The table in **§7.1. Payment Schedule** in **Section 7. Payment** in **Exhibit B** is hereby deleted:

Payment	Amount	
Interim Payment(s)	$91,200	Paid upon receipt of actual expense documentation and written Pay Requests from the Grantee for reimbursement of eligible approved expenses.
Final Payment	$4,800	Paid upon Substantial Completion of the Project (as determined by the State in its sole discretion), provided that the Grantee has submitted, and DOLA has accepted, all required reports.
Total	**$96,000**	

and is replaced with the following in lieu thereof:

Payment	Amount	
Interim Payment(s)	$141,200	Paid upon receipt of actual expense documentation and written Pay Requests from the Grantee for reimbursement of eligible approved expenses.
Final Payment	$4,800	Paid upon Substantial Completion of the Project (as determined by the State in its sole discretion), provided that the Grantee has submitted, and DOLA has accepted, all required reports.
Total	**$146,000**	

O. **Subsection 8.1.1 Quarterly Pay Request and Status Reports** in **Section 4. Administrative Requirements** in **Exhibit B** is hereby deleted:

"Quarterly Pay Request and Status Reports. Quarterly Pay Requests shall be submitted to DOLA in accordance with §4.5 of this Exhibit B."

and is replaced with the following in lieu thereof:

"**Monthly Pay Request and Status Reports. Monthly** Pay Requests shall be submitted to DOLA in accordance with **§4.5** of this **Exhibit B.**"

6. Limits of Effect and Order of Precedence

This Amendment is incorporated by reference into the Agreement, and the Agreement and all prior amendments or other modifications to the Agreement, if any, remain in full force and effect except as specifically modified in this Amendment Except for the Special Provisions contained in the Agreement, in the event of any conflict, inconsistency, variance, or contradiction between the provisions of this Amendment and any of the provisions of the Agreement or any prior modification to the Agreement, the provisions of this Amendment shall in all respects supersede, govern, and control. The provisions of this Amendment shall only supersede, govern, and control over the Special Provisions contained in the Agreement to the extent that this Amendment specifically modifies those Special Provisions.

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Chris Noeller, Chief of Police

SUBJECT: AN ORDINANCE APPROVING A MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF PUEBLO AND THE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES REGARDING THE NIBN NATIONAL CORRELATION AND TRAINING CENTER

SUMMARY:

This Ordinance approves a Memorandum of Understanding (the "NNCTC MOU") with the United States Department of Justice, Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), under which ATF's NIBIN National Correlation and Training Center will perform ballistic correlation reviews of evidence entered into the National Integrated Ballistic Information Network (NIBIN) by the Pueblo Police Department. The NNCTC returns NIBIN leads or negative results to the affected investigators within 24 to 48 hours.

A companion Ordinance approving the underlying NIBIN MOU with ATF is being presented for Pueblo City Council consideration at the same time. Each Ordinance stands on its own and may be approved or rejected independently, but both are necessary for the Pueblo Police Department to fully use the NIBIN program.

PREVIOUS COUNCIL ACTION:

Council has not previously acted regarding a NIBIN program or related ATF cooperative agreement with the Pueblo Police Department, based on available records.

BACKGROUND:

The NIBIN program is operated by ATF under the authority of 28 C.F.R. §§ 0.130 to 0.131 and the Gun Control Act of 1968, as amended, codified at Chapter 44 of Title 18 of the United States Code. NIBIN uses automated ballistic imaging technology to compare cartridge cases and bullets recovered from crime scenes against ballistic

evidence from other crimes nationwide.

ATF operates the NIBIN National Correlation and Training Center (NNCTC) as the centralized correlation review function for NIBIN partner sites. Under the NNCTC MOU, ballistic images that the Pueblo Police Department enters into NIBIN are routed to ATF technicians at the NNCTC, who perform the correlation review and return NIBIN leads or negative results to the affected investigators within 24 to 48 hours. All NNCTC work is peer-reviewed and signed off by a senior ATF firearms and tool mark examiner before dissemination.

Use of the NNCTC eliminates Minimum Required Operating Standards items 3 (correlation review within two business days) and 4 (lead dissemination within 24 hours) from the Pueblo Police Department's compliance obligations under the underlying NIBIN MOU. The Pueblo Police Department will provide quarterly reports to ATF indicating whether NIBIN leads were later confirmed by a firearms and tool mark examiner.

Information produced by the NNCTC is designated "Law Enforcement Sensitive" and is intended for official law enforcement use only. The NNCTC MOU expressly preserves the Pueblo Police Department's obligation to release records as required by State or Federal law or court of competent jurisdiction, subject to advance notification to ATF.

Either party may terminate the NNCTC MOU on 30 days written notice. The MOU is not a funding document; specific actions taken under it are subject to the City's funding and administrative or legislative approvals.

FINANCIAL IMPLICATIONS:

The NNCTC MOU is not a funding document and does not commit the City to any expenditure. The arrangement is a net financial benefit because it eliminates the need for the Pueblo Police Department to maintain in-house correlation review capacity for ballistic evidence entered into NIBIN.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If this Ordinance is not approved, the City will not enter into the NNCTC MOU. If the underlying NIBIN MOU is approved, the Pueblo Police Department will be required under Minimum Required Operating Standards items 3 and 4 to conduct its own correlation reviews and disseminate leads within 24 hours, which requires trained NIBIN users dedicated to that function. Without the NNCTC arrangement, the Pueblo Police Department will need to develop and maintain that in-house capacity.

RECOMMENDATION:

Approve the Ordinance.

ATTACHMENTS:

1. NNCTC PPD MOU (Nov 2021)

ORDINANCE NO.

AN ORDINANCE APPROVING A MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF PUEBLO AND THE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES REGARDING THE NIBN NATIONAL CORRELATION AND TRAINING CENTER

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The Memorandum of Understanding between the Bureau of Alcohol, Tobacco, Firearms and Explosives and the Pueblo Police Department regarding the NIBIN National Correlation and Training Center (the "NNCTC MOU"), a copy of which is attached hereto, having been approved as to form by the City Attorney, is hereby approved.

SECTION 2.

The Mayor is authorized to execute the NNCTC MOU in the name of the City, and the City Clerk is directed to affix the seal of the City thereto and attest same.

SECTION 3.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance and the attached NNCTC MOU to effectuate the policies and procedures described therein.

SECTION 4.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

Memorandum of Understanding (MOU)
Between

The
Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)

And

The

Pueblo Police Department

Hereinafter referred to as NIBIN Partner Site (NPS)

I. PURPOSE

This serves as an agreement between ATF and NPS: Pueblo Police Department

This agreement allows for ATF to perform correlation review(s) for the NPS ballistic evidence which is entered into the NIBIN database. These correlation reviews will be conducted by ATF through the NIBIN National Correlation and Training Center (NNCTC) and will be disseminated back to the affected parties as documented in this MOU.

II. ROLES AND RESPONSIBILITIES OF ATF

The NNCTC, on the basis of a request for assistance by the appropriate ATF Field Division Special Agent in Charge (or their Designee), will perform correlation reviews on all ballistic evidence entered into NIBIN by the NPS and issue documentation of the NIBIN Leads or Negative results to all affected parties within 24-48 hours. The NNCTC will not perform correlation reviews on evidence entered or received by the NPS prior to the NNCTC start date that is scheduled at the time of onboarding.

The ATF Special Agent in Charge initiating the request will assign a field division liaison to act as an intermediary between the NNCTC and the NPS and ensure that the protocols established by this MOU as well as MROS are followed in order to establish effective processes for the utilization of NIBIN in the field.

The services of the NNCTC will be handled by highly trained IBIS technicians. In addition, all of the technician's work will be peer reviewed and finally reviewed by a senior firearms and tool mark examiner assigned to the NNCTC prior to dissemination to the field.

The NNCTC will review any results with a Unified Score over 1.2 for every case. This standard was established based upon research and discussion within the NIBIN community as well as published articles on the subject. If necessary and justified by the circumstances of a particular investigation, the NNCTC will increase this threshold as warranted. A site may request a more

exhaustive search of the database or an expedited correlation review/response (under 24 hours) when the NPS deem it absolutely necessary and mission critical; however, appropriate justifications for such service will be required along with follow up written documentation to the NNCTC. These types of requests should be rare based upon the success we achieve with correlations results from the Unified Scoring System over 1.2 and the standard 24-48 hours turnaround; therefore, the procedure for the NPS to request a more exhaustive search will be handled via telephonic communication with the NNCTC Firearms and Tool mark Examiner supervisor and followed up by an email documenting the justification for such request(s).

The NNCTC is authorized to provide accurate and timely documentation of the correlation reviews and negative results to the parties through a distribution list provided by the sponsoring ATF Field Division.

III. ROLES AND RESPONSIBILITIES OF THE NPS

The true performance metric of NIBIN is the successful prosecution of shooters. In order to best utilize the services of the NNCTC, the NPS agrees to establish policies and procedures that adhere to the four critical steps of an effective and sustainable NIBIN program:

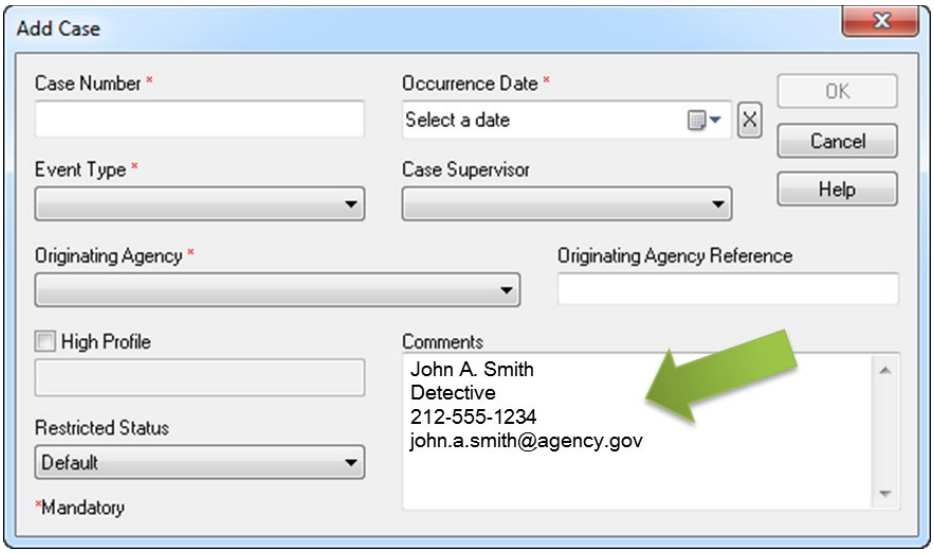
Comprehensive Collection: NPS must establish internal policies for the collection and submission of all evidence suitable for entry into NIBIN regardless of crime. Evidence includes cartridge cases recovered from crime scenes and test fires from seized or recovered crime guns.

Timely Turnaround: Since violent crime investigations can go "cold" very quickly the goal is to get the evidence into NIBIN as soon as possible after collection, then to provide any and all relevant NIBIN intelligence (NIBIN Leads/Negatives) back to the investigator within 24-48 hours.

Follow-Up: Investigators, intelligence personnel and prosecutors should pursue NIBIN Leads as appropriate. Follow-up contains three distinct but overlapping components: comprehensive crime gun intelligence, effective and thorough criminal investigation, and consistent prosecution.

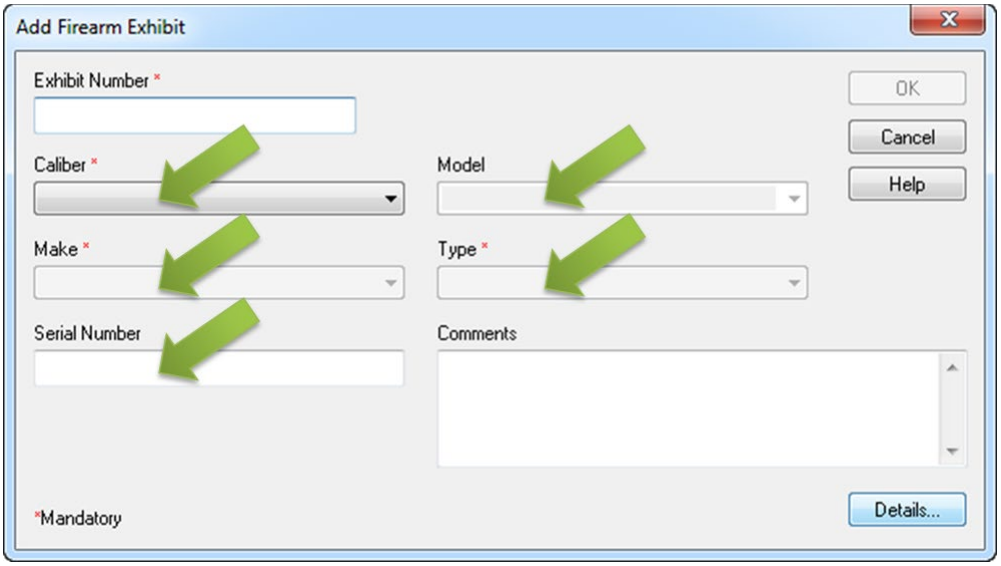
Feedback: Feedback is necessary for the sustained success of a NIBIN program and allows all involved to benefit from the process through ongoing evaluation and innovation. Feedback should be provided to all parties involved including patrol, investigative, lab, and intelligence personnel.

1. The NPS will enter the applicable investigator(s) contact information into the case comments section when entering evidence into IBIS. The contact information for said investigator should contain at a minimum: Name, Title, Telephone number and Email address in the format provided below. This will allow for the establishment of clear lines of communication between the NNCTC and the field investigators in order to best utilize the NIBIN Lead during the course of criminal investigations.



2. If the NPS conducts occasional or mission specific correlations reviews in lieu of utilizing the services of the NNCTC, the NPS will indicate this fact by changing the status of the corresponding IBIS correlation requests to "**Previously Viewed**" in order to prevent redundancy.

3. For every test fired cartridge case acquired into IBIS, the NPS will provide all applicable make; model; caliber; and serial number, by associating an IBIS firearm exhibit to the test fired cartridge case or bullet exhibit. The serial number should be documented exactly as it is inscribed on the firearm, NO special characters or titles (i.e. do not input "serial # 123AEG instead input 123AEG"). This will facilitate accurate and timely crime gun intelligence. Also, an effort should be made to enter any other available firearm information in the Firearm Exhibit Details section, such as recovery information and/or possessor.



IV. REPORTING REQUIREMENTS

On a quarterly basis the NPS will provide a report to the ATF Field Division liaison detailing whether or not any ATF issued NIBIN Lead(s) were later confirmed by a Firearm and Tool mark Examiner.

It is strongly recommended that the NPS forward any relevant NIBIN success stories to ATF. Doing so reaffirms the importance of NIBIN and assists with the advancement of the local and national NIBIN program(s). These success stories can be provided to the ATF Field Division Liaison or emailed directly to mailto:NNCTC-FOD@atf.gov

V. FUNDING AND ADMINISTRATIVE MATTERS

This MOU is not an obligation or commitment of funds, nor a basis for transfer of funds. This MOU is a basic statement of the understanding between parties of the matter described herein. Expenditures by each party will be subject to its budgetary processes and to the availability of funds and resources pursuant to applicable laws, regulations, and policies. The parties expressly acknowledge that the language in this MOU in no way implies that funds will be made available for such expenditures.

VI. INFORMATION SHARING CONDITIONS

Both ATF and the NPS acknowledge their understanding that work performed under this MOU by the NNCTC is "LAW ENFORCEMENT SENSITIVE" and intended "FOR OFFICIAL LAW ENFORCEMENT USE ONLY." Failure to protect and safeguard such data from loss, misuse, or unauthorized access could adversely affect law enforcement operations, including those areas related to officer safety, as well as, the fair and equitable administration of justice, and the privacy of individuals. Information provided by the NCNTC shall be used for investigative purposes only.

No information produced pursuant to this MOU may be duplicated, reproduced, or disseminated without the express authorization of ATF and/or the NPS, except as may be required by State or Federal law or court of competent jurisdiction. The Parties agree that premature disclosure of NNCTC data can reasonably be expected to interfere with pending or prospective law enforcement proceedings. It is agreed that the law enforcement sensitive firearms information generated pursuant to this MOU shall not be disclosed to a third party without the consent of both Parties of this MOU, subject to Federal and any applicable non-conflicting State law. The Parties agree to notify all other Parties to the MOU prior to the release of any sensitive firearms information to a third party under State or Federal law.

Releases to the media or third parties, judicial demands, public announcements, Freedom of Information Act/Privacy Act/Open Records requests, and communications with Congress concerning information generated and retrieved pursuant to this MOU shall be addressed by the Parties following coordination by authorized representatives of each Party.

Over the course of the agreement, both parties may come across information that may identify U.S. persons whose information is protected by the Privacy Act of 1974 and/or Executive Order 12333 (or any successor executive order). All such information will be handled lawfully

pursuant to the provisions thereof.

VII. COMMENCEMENT OR EFFECTIVE DATE DETERMINATION

The terms of this MOU will become effective on the date on which it is signed by all parties. This MOU will remain valid until modified or rescinded by written mutual consent or terminated unilaterally after 30 days advanced written notice by any party via certified mail. Notice shall be made to the Chief, Firearms Operations Division of ATF, 99 New York Ave NE Room 6N. 555Washington DC 20226. This fully executed MOU is entered into by ATF and the NPS prior to the commencement of service by the NNCTC to facilitate a logical transition of correlation services from the NPS to the NNCTC. The onboarding date, determined by both the NNCTC and NPS, will be the date used by the NPS for acceptable entry and receiving dates of submissions to the NNCTC as indicated in Section II, Paragraph 1 of the MOU.

Signature Date	Signature Date
(Chief Law Enforcement or Public Safety Official)	(ATF - Special Agent in Charge)
	Chris Ashbridge
Name	Name
	Special Agent in Charge
Title	Title
Pueblo Police Department	Denver
NESS Partner Site	ATF Field Division

Signature Date

Name

Chief, Firearms Operations Division
Title

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Chris Noeller, Chief of Police

SUBJECT: AN ORDINANCE APPROVING A MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF PUEBLO AND THE BUREAU OF ALCOHOL, TOBACCO, FIREARMS, AND EXPLOSIVES REGARDING THE NATIONAL INTEGRATED BALLISTIC INFORMATION NETWORK

SUMMARY:

This Ordinance approves a Memorandum of Understanding (the "NIBIN MOU") with the United States Department of Justice, Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), that will allow the Pueblo Police Department to receive and operate an ATF-loaned National Integrated Ballistic Information Network (NIBIN) unit for processing shell casings recovered as evidence in firearms-related crimes. The NIBIN MOU governs the deployment, operation, security, audit, and disclosure obligations associated with the NIBIN system itself.

A companion Ordinance approving a separate MOU with ATF's NIBIN National Correlation and Training Center is being presented for Pueblo City Council consideration at the same time. Each Ordinance stands on its own and may be approved or rejected independently, but both are necessary for the Pueblo Police Department to fully use the NIBIN program.

PREVIOUS COUNCIL ACTION:

Council has not previously acted regarding a NIBIN program or related ATF cooperative agreement with the Pueblo Police Department, based on available records.

BACKGROUND:

The NIBIN program is operated by ATF under the authority of 28 C.F.R. §§ 0.130 to 0.131 and the Gun Control Act of 1968, as amended, codified at Chapter 44 of Title 18 of the United States Code. NIBIN uses automated ballistic imaging technology to compare cartridge cases and bullets recovered from crime scenes against ballistic

evidence from other crimes nationwide, generating investigative leads that link firearms and shooters across cases and jurisdictions.

ATF has offered to deploy a NIBIN unit to the Pueblo Police Department on a loan basis. The unit remains the property of ATF and may be relocated to another agency at ATF's discretion. The NIBIN MOU sets the terms of the loan. ATF installs and maintains the equipment, ATF and the United States Department of Justice may audit operations, and the Pueblo Police Department designates a NIBIN Program Administrator and qualified users who pass criminal and fingerprint background checks.

Either party may terminate the NIBIN MOU on 30 days written notice. The MOU is not a funding document; specific actions taken under it are subject to the City's funding and administrative or legislative approvals.

The Pueblo Police Department Records Section will adopt an internal protocol flagging NIBIN material and requiring notification to ATF before any release in response to a Colorado Criminal Justice Records Act request, a subpoena, or a Brady or discovery obligation in a criminal prosecution. This protocol satisfies the NIBIN MOU's disclosure restriction while preserving the official custodian's discretion under C.R.S. § 24-72-305.

FINANCIAL IMPLICATIONS:

The NIBIN MOU is not a funding document. The MOU makes the City responsible for any physical construction required at the installation site, the cost of moving the equipment after initial installation, and the cost of repair or replacement if Pueblo Police Department personnel cause unauthorized damage or movement. The City must also conduct criminal and fingerprint background checks on Pueblo Police Department personnel designated as NIBIN users, at City cost.

BOARD/COMMISSION RECOMMENDATION:

Not applicable to this Ordinance.

STAKEHOLDER PROCESS:

Not applicable to this Ordinance.

ALTERNATIVES:

If this Ordinance is not approved, the City will not enter into the NIBIN MOU and ATF will not deploy the NIBIN unit to the Pueblo Police Department. The Pueblo Police Department will continue to send ballistic evidence to other NIBIN-equipped agencies for processing, with the associated delay in investigative leads and the loss of timely intelligence on firearms-related crime in Pueblo.

RECOMMENDATION:

Approve the Ordinance.

ATTACHMENTS:

1. NIBIN PPD MOU (June 2022)

ORDINANCE NO.

AN ORDINANCE APPROVING A MEMORANDUM OF UNDERSTANDING BETWEEN THE CITY OF PUEBLO AND THE BUREAU OF ALCOHOL, TOBACCO, FIREARMS, AND EXPLOSIVES REGARDING THE NATIONAL INTEGRATED BALLISTIC INFORMATION NETWORK

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

The Memorandum of Understanding between the Bureau of Alcohol, Tobacco, Firearms and Explosives and the Pueblo Police Department regarding the National Integrated Ballistic Information Network (the "NIBIN MOU"), a copy of which is attached hereto, having been approved as to form by the City Attorney, is hereby approved.

SECTION 2.

The Mayor is authorized to execute the NIBIN MOU in the name of the City, and the City Clerk is directed to affix the seal of the City thereto and attest same.

SECTION 3.

The officers and staff of the City are authorized to perform any and all acts consistent with the intent of this Ordinance and the attached NIBIN MOU to effectuate the policies and procedures described therein.

SECTION 4.

This Ordinance shall become effective on the date of final action by the Mayor and City Council.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____
City Clerk

MEMORANDUM OF UNDERSTANDING

Between the Bureau of Alcohol, Tobacco, Firearms and Explosives and the
PUEBLO POLICE DEPARTMENT.
Regarding the National Integrated Ballistic Information Network

This Memorandum of Understanding (MOU) is entered into by the U.S. Department of Justice (DOJ), Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), and the PUEBLO POLICE DEPARTMENT, hereinafter collectively referred to as "the parties," and the PUEBLO POLICE DEPARTMENT, referred to as the "NIBIN Partner." This MOU establishes and defines a partnership between the parties that will result in an ATF National Integrated Ballistic Information Network (NIBIN) system installation, operation, and administration for the collection, timely analysis, and dissemination of crime gun data to enhance the efforts of law enforcement to integrate resources to reduce firearms violence, identify shooters, and refer them for prosecution.

AUTHORITY

This MOU is established pursuant to the authority of the participants to engage in activities related to the investigation and suppression of violent crimes involving firearms. ATF's authorities are set forth in Title 28, Code of Federal Regulations, sections 0.130-0.131, and include the power to investigate violations of the Gun Control Act of 1968 (as amended), Title 18, United States Code, Chapter 44.

BACKGROUND

The ATF NIBIN Program uses sophisticated technology to compare images of ballistic evidence. It is part of an integrated investigative approach to reduce firearms violence and improve crime gun intelligence. Through aggressive targeting, investigation, and prosecution of shooters and their sources of crime guns, Federal, State, tribal, and local law enforcement agencies work in concert to combat firearms-related violence.

SCOPE

Participation in this program is expressly restricted to the sharing of ballistic imaging of firearms data associated with crimes recovered by any law enforcement agency in the United States and international law enforcement partners who have entered into agreements with ATF to share ballistic data. ATF may work with our international law enforcement partners to search their networks in an effort to identify a crime gun in their database against a crime gun in ATF's NIBIN network.

NIBIN systems are to be used to image ballistic evidence and test fires of firearms illegally possessed, used in a crime, or suspected by law enforcement officials of having been used in a crime. Ballistics information and/or evidence from firearms taken into law enforcement custody through a gun buy-back program, property damage crimes involving firearms, found or abandoned firearms, and domestic disturbances are also permitted to be entered in the NIBIN system.

Any NIBIN unit, whether ATF-owned or site-purchased, will not be used to capture, share, or store ballistic images acquired at the point of manufacture, importation, or sale of a firearm, or images of law enforcement-issued firearms not associated with crimes. The NIBIN system does not store information related to firearms owners or registration.

APPLICABLE LAWS

The applicable statutes, regulations, directives, and procedures of the United States, DOJ, and ATF shall govern this MOU and all documents and actions pursuant to it. Nothing in this MOU will prevail over any Federal law, regulation, or other Federal rule recognized by ATF. Notwithstanding the foregoing, nothing in this agreement will be construed as a waiver of sovereign immunity in excess of or beyond that which is authorized by the law of the NIBIN Partner's jurisdiction. This MOU is not a funding document. All specific actions agreed to herein shall be subject to funding and administrative or legislative approvals.

MODIFICATIONS AND TERMINATIONS

This MOU shall not affect any pre-existing or independent relationships or obligations between the parties. If any provision of this MOU is determined to be invalid or unenforceable, the remaining provisions shall remain in force and unaffected to the fullest extent permitted by law and regulation.

Except as provided herein, this MOU may be modified or amended only by written mutual agreement of the parties. Either party may terminate this MOU by providing written notice to the other party. The termination shall be effective upon the thirtieth calendar day following provision of notice, unless an alternative date is agreed upon.

If either party terminates this MOU, ATF will retain its interest in the electronically stored information contained in the database and any ATF-deployed NIBIN system. ATF agrees to provide to the NIBIN Partner an electronic copy of the data collected by the NIBIN Partner, subject to Federal law and regulation.

LIABILITY

The NIBIN Partner hereby agrees to assume full and sole liability for any damage, injury, or harm of any sort caused by the operation and use of any NIBIN system or related to the use and interpretation of any information contained in, processed by, or extracted from any database subject to this agreement and the protocols and procedures of the NIBIN Program, to the extent allowed by law.

The rights and obligations set out in this MOU run between the signatories. Nothing in this MOU is intended to create any substantive or procedural rights, privileges, or benefits enforceable in any administrative, civil, or criminal matter by any prospective or actual third-parties.

ATF-DEPLOYED SYSTEM INSTALLATION

The NIBIN Partner hereby agrees and acknowledges that all ATF-deployed NIBIN systems shall remain the property of ATF and the U.S. Government. ATF agrees to provide, install, and maintain all ATF-deployed NIBIN systems for use by the NIBIN Partner and any other law enforcement agencies served by or in partnership with the NIBIN Partner. Should the installation of the NIBIN system require physical construction at the site, the NIBIN Partner will be responsible for such construction and any associated costs. If a system is to be moved to allow additional access outside of a laboratory, ATF will work with the NIBIN Partner to ensure the appropriate protocols are put into place to ensure the integrity of crime gun evidence along with maximum use of the equipment.

ATF-DEPLOYED SYSTEM MAINTENANCE

ATF will maintain all ATF-deployed NIBIN systems furnished to the NIBIN Partner and repair or replace inoperable or outdated systems in an expeditious manner, subject to availability and funding. However, maintenance and repairs required as the result of unauthorized movement, alteration, damage, or destruction will not be assumed by ATF. At all times, the NIBIN Partner agrees not to make or cause to be made any repairs, alterations, movements, additions, improvements, or replacements to the NIBIN systems not expressly authorized in writing by ATF in advance, and further agrees to exercise due care in every respect to prevent system movement, damage, destruction, or misuse.

ATF-DEPLOYED SYSTEM USAGE

Because the NIBIN Program focuses on the reduction of firearms-related violent crimes, the NIBIN Partner shall enter all eligible ballistic evidence recovered from crime scenes as soon as possible. In addition, the NIBIN Partner shall enter into NIBIN test-fire cartridge cases from eligible firearms taken into law enforcement custody in a timely manner. All NIBIN Partner-owned NIBIN equipment will be held to same standards as ATF-deployed systems. NIBIN Partners may not charge other law enforcement agencies for the entry of evidence into ATF-owned or ATF-maintained automated ballistics technology used in the NIBIN Program.

ATF-DEPLOYED SYSTEM REMOVAL

ATF retains the right to remove a NIBIN system upon: (1) a determination that the equipment is neglected or misused; (2) a determination that the equipment is not used effectively to combat violent crime; (3) failure to comply with any obligations or requirements set forth in this MOU; (4) receipt of written notification of the termination of the participation of the NIBIN Partner in the NIBIN Program; (5) the cancellation of this MOU by ATF; or (6) termination of the NIBIN Program by ATF.

If ATF intends to remove a NIBIN system from the NIBIN Partner, ATF will provide written notice.

SELF-PURCHASED SYSTEMS

All clauses that reference ATF-Deployed Systems are not applicable to agencies that self-purchase equipment. However, all other requirements involving network requirements, usage, Minimum Required Operating Standards (MROS), movement of equipment, network requirements and security requirements do apply to all agencies on the NIBIN network. These requirements ensure the integrity of the database and the network security.

SYSTEM MOVEMENT

If the NIBIN Partner seeks to move its NIBIN system, it must submit a written request to ATF. ATF's decision regarding the proposed move will be provided to the NIBIN Partner in writing. Any movement of the NIBIN system after the initial installation will occur at the expense of the NIBIN Partner and only after receipt of authorization by, and coordination with, FTI. In order to realize maximum use of the equipment, it should be placed where trained personnel can expeditiously enter evidence. ATF will work with each partner to realize optimal placement of equipment to obtain actionable investigative leads.

In the event of a natural disaster, ATF will work with the NIBIN Partner to safeguard the NIBIN equipment.

Due to communication line installation/move requirements, NIBIN Partners must provide a minimum of 120 calendar days' advance notice to ATF and the NIBIN system manufacturer before the intended move of a NIBIN system.

In the event of unauthorized movement, alteration, damage, or destruction of any NIBIN system caused by its employees, contractors, or any other person under its control, the NIBIN Partner agrees to assume the cost of replacement or repairs of the equipment.

The NIBIN Partner agrees to report to ATF, within 5 calendar days, any incident involving the following: an unauthorized movement, alteration, damage, or destruction of ATF-deployed NIBIN systems, any unauthorized use of NIBIN systems or the unauthorized release of data related to the NIBIN Program.

COMMUNICATION LINES

ATF will provide and support primary communication lines necessary for connecting NIBIN systems to the NIBIN network.

SECURITY

The NIBIN Partner will comply with all ATF, DOJ and/or other Federal security requirements related to the NIBIN program, network, and systems to ensure the integrity of the program. These requirements are set forth under NIBIN security policies. ATF

will promptly notify the NIBIN Partner should these requirements change. All NIBIN sites will not knowingly allow a person to access the NIBIN network using another person's user ID and password.

The NIBIN Partner agrees to conduct criminal background checks, including fingerprint checks, of all NIBIN users. Upon successful completion of these background checks, the NIBIN Partner will notify ATF's NIBIN Branch in writing.

SYSTEM USAGE AND MINIMUM REQUIRED OPERATING STANDARDS

To ensure the consistency, integrity, and success of NIBIN, ATF has enacted Minimum Required Operating Standards (MROS). The MROS, listed below, are rooted in ATF's "Four Critical Steps for a Successful NIBIN Program" – comprehensive collection, timeliness, investigative follow-up, and feedback. They identify the practices that best allow NIBIN to provide comprehensive and timely crime gun intelligence.

1. Enter all fired or test fired cartridge cases from serviced law enforcement agencies and/or departments through a NIBIN acquisition machine within 2 business days of receipt.

2. Enter accurately all required information during the acquisition process on the NIBIN acquisition machine.

3. Correlate and conduct a secondary review of any potential NIBIN leads through an approved NIBIN correlation machine within 2 business days.

4. Disseminate NIBIN leads within 24 hours.

5. Designate and maintain a NIBIN program administrator.

6. No policy shall inhibit or restrict NIBIN submissions by serviced law enforcement agencies and/or departments.

7. Operate with only qualified NIBIN users.

Please note that Standards 3 and 4 are not applicable to NIBIN sites using the NIBIN National Correlation and Training Center for correlation reviews of ballistic images.

As a NIBIN partner, the PUEBLO POLICE DEPARTMENT is striving to meet the MROS by developing and implementing changes in their operations and working toward compliance. Each NIBIN site must be in compliance with MROS or working towards compliance to the satisfaction of the Crime Gun Intelligence Governing Board.

AUDITS

ATF and the NIBIN Partner acknowledge their understanding that the operations described in this MOU are subject to audit by ATF, DOJ, the DOJ Office of the Inspector

General, the General Accountability Office, and other auditors designated by the U.S. Government regardless of the funding source for the system (NIBIN Partner or ATF). Such audits may include reviews of all records, performance measurements, documents, reports, accounts, invoices, receipts, or other evidence of expenditures related to this MOU and the NIBIN Program.

Notwithstanding, ATF will conduct audits of all NIBIN Partners and their sites once every two years for the remainder of the MOU. The purpose of the audits is to review and verify compliance with the required MROS. Each site must be in full compliance with the MROS in order to maintain access to NIBIN.

Further, the NIBIN Partner agrees to allow auditors to conduct one or more in-person interview(s) of any and all personnel the auditors determine may have knowledge relevant to transactions performed or other matters involving this MOU and the NIBIN Program.

The NIBIN Partner hereby acknowledges its understanding that, for accounting purposes, that the principles and standards for determining costs shall be governed by the policies set forth in the Office of Management and Budget Circular A-87, revised (available via the OMB, the Superintendent of Documents at the U.S. Government Printing Office, or via the Internet at http://www.whitehouse.gov/omb/circulars/a087/a087-all.html.)

PERSONNEL AND TRAINING

Prior to the execution of this MOU and a NIBIN system installation, the NIBIN Partner must employ, or have access to, a technical person capable of performing forensic microscopic comparison of bullet and cartridge evidence.

The NIBIN Partner agrees to provide and maintain sufficient personnel to operate the NIBIN system and agrees to allow use of the equipment by ATF personnel or our representatives to support the program at the host location. All personnel accessing NIBIN must be a Qualified NIBIN User as required by the MROS. This MOU should not be construed to require the hiring of any new personnel, except at the discretion of the NIBIN Partner. If the NIBIN Partner determines that additional personnel resources are required, all costs associated with this hiring will be borne by the NIBIN Partner. All users of the equipment must satisfy the same requirements as other NIBIN users and be properly trained, qualified and approved in advance by ATF.

Following basic entry training, ATF will verify trainee competency before authorizing network access. Individuals trained internally by a NIBIN Partner will not be certified as appropriately trained until they successfully pass a competency test administered by ATF.

The NIBIN Partner may provide access to the NIBIN system under its operational control to another law enforcement agency. Any such other law enforcement agency agrees to the same restrictions placed upon the NIBIN Partner by this MOU. However, the NIBIN Partner agrees to assume full liability and responsibility for the administration of such access.

Access to the NIBIN system will be under the management and control of the NIBIN Partner. The NIBIN Partner will ensure that only trained, cleared and qualified personnel have access to the NIBIN system.

Participating agencies will develop the appropriate standard operating procedures to ensure all eligible ballistic evidence will be submitted for NIBIN.

COORDINATION

ATF and the NIBIN Partner agree to adhere to standardized procedures and policies for collecting, handling, documenting, transporting and preserving firearms, bullets, casings and any similar evidence submitted for analysis and input into NIBIN.

ATF and the NIBIN Partner similarly agree to adhere to standardized procedures and policies for the source data collection, input, exchange and protection of information, to include information as to the location where ballistic evidence was collected, the circumstances under which it was collected and all crimes to which the firearm(s) or other ballistic evidence is linked.

ATF and the NIBIN Partner agree to cooperate in the development and implementation of data entry protocols and quality assurance procedures for the NIBIN Program. ATF further agrees to cooperate with all participants in the NIBIN Program to establish model standards, protocols, and procedures for the users of the network. Such protocols will be applicable as they are implemented.

The NIBIN Partner will require all participating law enforcement agencies to adhere to the protocols, procedures, policies and quality assurance standards as established above.

Except as expressly prohibited by law, the NIBIN Partner agrees to provide ATF with access to all information, reports and any other relevant information regarding crimes related to evidence entered into the system as well as monthly reports outlining historical, statistical and case adjudication information on the use and results of the use of the NIBIN Program and/or system and the related services provided by ATF and the system manufacturer in order to ensure the capturing of required performance management information. Such information will be gathered for the purpose of informing the law enforcement community, other Government agencies, Congress and the public on NIBIN results. Additionally, ATF will collect information for results-oriented performance measures.

PUBLICITY

Any NIBIN Partner who becomes aware of, or participates in, publicity related to the NIBIN system and investigations within their jurisdiction should advise ATF of same within 48 hours.

DISCLOSURE OF INFORMATION RELATED TO NIBIN

NIBIN system information may be shared with other law enforcement and prosecutors' offices in furtherance of criminal investigations and prosecutions. The NIBIN Partner shall not share any NIBIN system information for other purposes, including requests under the Freedom of Information Act, without express, written authorization from ATF.

INCORPORATION OF APPENDIX

The Appendix to this MOU includes definitions of terms used and is fully incorporated herein. Because requirements may change over time, due to technological advances, security enhancements, or budgetary matters, the Appendix may be updated.

AGREEMENT

ATF and the NIBIN Partner hereby agree to abide by the terms and conditions of this MOU, including any appendices, and all policies of the NIBIN Program. The terms and conditions of this MOU will be considered accepted in their entirety upon the signature by the ATF Special Agent in Charge and the NIBIN Partner signature.

_____ _____
Name of Chief Law Enforcement/Public Safety Official Date
Name of Agency
Street address
City, State, Zip Code

_____ _____
Name of SAC Date
Special Agent in Charge, _____Field Division
Bureau of Alcohol, Tobacco, Firearms and Explosives

_____ _____
Chief, Firearms Operations Division Date
Bureau of Alcohol, Tobacco, Firearms and Explosives

APPENDIX

TERMS

Acquisition - An entry of a ballistic image.

ATF – Bureau of Alcohol, Tobacco, Firearms and Explosives, a principal law enforcement agency within the U.S. Department of Justice.

Bullets – Designated calibers of projectiles fired from rifles, revolvers, and pistols.

Cartridge cases – Designated metal casings from cartridges fired from rifles, shotguns, revolvers, and ejected from pistols.

Correlation – Automated data comparison of signature images to a database.

Crime Gun – Any firearm that is illegally possessed, used in a crime, or suspected by law enforcement officials of having been used in a crime or act of terrorism.

Found or Abandoned Firearms – Firearms that come into the custody of law enforcement outside of investigative or judicial process. A found firearm is located by law enforcement or a non-owner and the owner-possessor is not readily identifiable (e.g., a firearm found in an open field). An abandoned firearm may be a found firearm or a firearm where the possessor chooses to permanently relinquish control of the firearm and abandon any rights of ownership. ATF suggests that NIBIN Partners provide written notice to those persons permanently abandoning or temporarily relinquishing custody of a firearm that the firearm will be test fired and the results entered into the NIBIN System.

NIBIN Network – An ATF-designed and maintained system of interconnected computer systems and terminals used in support of the NIBIN Program.

NIBIN Program – The integration of aggressive targeting, investigation, and prosecution of shooters and their sources of crime guns using automated ballistics technology.

NIBIN Program Administrator – An individual the NIBIN site has designated to communicate with all parties (e.g., submitting law enforcement agencies, ATF Crime Gun Intelligence Centers) involved in the NIBIN process. The NIBIN Program Administrator must be a qualified NIBIN user and full-time employee of the NIBIN site. The NIBIN Program Administrator should be responsible for implementing and directing policies and procedures of the NIBIN site.

NIBIN System – Refers to the integrated ballistic imaging, analysis, and information processing system for use with automated ballistics technology.

Performance Measurements – Various management instruments used to evaluate program effectiveness in successfully removing shooters and their crime gun sources. Performance measurements also include the NIBIN Minimum Required Operating Standards and related audits.

Potential Candidate for Confirmation – Two bullets or cartridges cases displaying sufficient similarity during a correlation review such that the items should be compared using traditional comparative microscopy by a trained firearm examiner to determine if they can be associated to the same firearm.

Qualified NIBIN User – technician and/or firearms examiner trained by ATF, Forensic Technology, and/or a NIBIN Authorized Trainer program to perform acquisition and/or correlation reviews of ballistic images on the NIBIN network.

Security Requirements – Types and levels of physical and cyber protection necessary for equipment, data, information, applications, and facilities to meet security policies and standards.

Security Policies – The set of laws, rules, directives, and practices that regulate how an organization manages, protects and distributes controlled information.

Timely – Occurring at a suitable time and without unnecessary delay. Some NIBIN submissions require a response within 48 hours to be considered timely.

Volunteer – An individual who has chosen to perform services without charge or payment and has entered into a written agreement with a NIBIN Partner addressing issues of confidentiality, costs, and waiver of all claims against the Federal government.

Background Paper for Proposed Ordinance

COUNCIL MEETING DATE: June 8, 2026

TO: President Mark Aliff and Members of City Council

CC: Mayor Heather Graham

VIA: Clyde Bishop, City Clerk

FROM: Danny Nunn, Director of Finance
Chris Noeller, Chief of Police

SUBJECT: AN ORDINANCE APPROVING THE CONTRIBUTION OF $215,000 IN SUPPORT OF THE FALLEN OFFICER MEMORIAL, ESTABLISHING PROJECT CI2615 - FALLEN OFFICER MEMORIAL, TRANSFERRING $150,000 FROM PUEBLO POLICE DEPARTMENT WAGES/POLICE SERVICE ACCOUNT 10120502-51030 TO PROJECT CI2615, AND TRANSFERRING FUNDS IN THE AMOUNT OF $65,000 FROM PROJECT ACCOUNT CI2113 - ARPA INTEREST TO PROJECT CI2615

SUMMARY:

This Ordinance establishes Project CI2615 – Fallen Officer Memorial within the City's Capital Improvement Fund and provides funding for the City's contribution to the Pueblo Fallen Peace Officer Memorial Foundation, the nonprofit entity responsible for constructing the Fallen Officer Memorial at the Historic Arkansas Riverwalk of Pueblo.

PREVIOUS COUNCIL ACTION:

The City has previously participated in capital projects leveraging ARPA interest and departmental salary savings transfers.

BACKGROUND:

The Fallen Officer Memorial is a community-supported initiative honoring law enforcement officers who have lost their lives in the line of duty. The total project cost is estimated at approximately $390,000. To date, community fundraising efforts have generated roughly $120,000 toward this goal. Additional contributions are anticipated from partnering agencies in support of the project.

To support the timely advancement of the project, the City's contribution will be sourced from available salary savings within the Pueblo Police Department and from ARPA interest revenue already allocated within the Capital Improvement Fund under Project CI2113. Establishing Project CI2615 will allow the City to consolidate funding for

budgeting and financial tracking of the Memorial project.

FINANCIAL IMPLICATIONS:

This Ordinance transfers:

• $150,000 from the Pueblo Police Department Wages/Police Service Account 10120502-51030 to Project CI2615;

and

• $65,000 from Project CI2113 – ARPA Interest to Project CI2615.

No additional Fund appropriations are required. All transfers are from existing, available balances.

BOARD/COMMISSION RECOMMENDATION:

N/A

STAKEHOLDER PROCESS:

N/A

ALTERNATIVES:

City Council may choose not to authorize the establishment of the project or not to approve the proposed funding transfers. This would delay or prevent the City's participation in the Fallen Officer Memorial project.

RECOMMENDATION:

Approval of the Ordinance.

ATTACHMENTS:

None

ORDINANCE NO.

AN ORDINANCE APPROVING THE CONTRIBUTION OF $215,000 IN SUPPORT OF THE FALLEN OFFICER MEMORIAL, ESTABLISHING PROJECT CI2615 - FALLEN OFFICER MEMORIAL, TRANSFERRING $150,000 FROM PUEBLO POLICE DEPARTMENT WAGES/POLICE SERVICE ACCOUNT 10120502-51030 TO PROJECT CI2615, AND TRANSFERRING FUNDS IN THE AMOUNT OF $65,000 FROM PROJECT ACCOUNT CI2113 - ARPA INTEREST TO PROJECT CI2615

WHEREAS, the City of Pueblo supports the construction of the Fallen Officer Memorial on the Historic Arkansas Riverwalk of Pueblo; and

WHEREAS, the total estimated project cost is approximately $390,000, including roughly $120,000 raised through private fundraising; and

WHEREAS, the City intends to contribute funds to the Pueblo Fallen Peace Officer Memorial Foundation by utilizing available American Rescue Plan Act (ARPA) interest revenue from Project CI2113 and salary savings within the Pueblo Police Department; and

WHEREAS, sufficient funds exist in the Pueblo Police Department Wages/Police Service Account and in Project CI2113 – ARPA Interest to support transfers totaling $215,000 for the establishment of Project CI2615 – Fallen Officer Memorial; NOW, THEREFORE,

BE IT ORDAINED BY THE CITY COUNCIL OF PUEBLO, that:

SECTION 1.

Project CI2615 – Fallen Officer Memorial is hereby established in the Capital Improvement Fund for the purpose of supporting the construction of the Fallen Officer Memorial through a contribution to the Pueblo Fallen Peace Officer Memorial Foundation.

SECTION 2.

The City’s 2026 Budget is hereby amended by transferring One Hundred Fifty Thousand Dollars ($150,000) from the Pueblo Police Department Wages/Police Service Account 10120502-51030 into Project CI2615.

SECTION 3.

The City’s 2026 Budget is further amended by transferring Sixty-Five Thousand Dollars ($65,000) from Project CI2113 – ARPA Interest into Project CI2615.

SECTION 4.

The officers and staff of the City are authorized to disburse project funds from Project CI2615 to the Pueblo Fallen Peace Officer Memorial Foundation for costs associated with the

construction of the Fallen Officer Memorial, and to execute any documents necessary to effectuate such contribution.

SECTION 5.

The officers and staff of the City are authorized to perform any and all acts consistent with this Ordinance to implement the transfers and Project CI2615 as described herein.

SECTION 6.

This Ordinance shall become effective immediately upon final passage and approval.

Action by City Council:

Introduced and initial adoption of Ordinance by City Council on May 26, 2026.

Final adoption of Ordinance by City Council on June 8, 2026.

_____
President of City Council

Action by the Mayor:

☐ Approved on _____.

☐ Disapproved on _____ based on the following objections:

_____

_____

_____

_____

_____
Mayor

Action by City Council After Disapproval by the Mayor:

☐ Council did not act to override the Mayor's veto.

☐ Ordinance re-adopted on a vote of _____, on _____

☐ Council action on _____ failed to override the Mayor's veto.

_____
President of City Council

ATTEST

_____

City Clerk