

Ridgway Sustainability Advisory Board Meeting Agenda



Wednesday, May 3, 2023

Pursuant to the Town's Electronic Participation Policy, the meeting will be conducted both in person and via a virtual meeting portal. Members of the public may attend in person at the Community Center, located at 201 N. Railroad Street, Ridgway, Colorado 81432, or virtually using the meeting information below.

Join Zoom Meeting

<https://us02web.zoom.us/j/81658915600?pwd=K1RKeEhtVzk4UDA3VmYrMnp0NXFHUT09>

Meeting ID: 816 5891 5600

Passcode: 458478

Dial by your location

+1 346 248 7799 US

+1 253 215 8782 US

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5:00 p.m.

CALL TO ORDER & ROLL CALL Angela Hawse, Vicki Hawse, Joyce Huang, Dana Ivers, Dave Jones, Ken Mihelich, JT Thomas

ADDITIONS TO THE AGENDA

NEW BUSINESS

Item 1 – Presentation by Kim Wheels regarding differences between the 2018 IECC and the 2021 IECC.

Item 2 – Update from Terry Schuyler regarding SMPA Solar Array Project

Item 3 – Update regarding website design and content

Item 4 – Discussion regarding design of Ridgway Reusable Bags

Item 5 – Approval of minutes from April 18, 2023 meeting

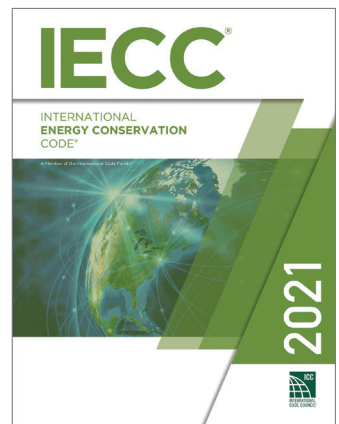
ADJOURNMENT

AGENDA ITEM #1

What's New in the 2021 International Energy Conservation Code® (IECC®)

The IECC addresses energy efficiency on several fronts including cost savings, reduced energy usage, conservation of natural resources and the impact of energy usage on the environment. Key changes to the 2021 IECC improve efficiency by 9.4 percent and reduce greenhouse gases by 8.7 percent over the 2018 IECC; these changes include new provisions that increase efficiency and encourage greater flexibility in design and construction as well as changes to existing requirements that provide clarification and improve useability of the code.

The following are key changes in the 2021 IECC by building type and system:



IECC, Commercial

Building Envelope

- Increased insulation requirements and reduced fenestration U-factors and solar heat gain coefficients.
- Extended requirements for envelope air leakage testing and verification.
- New provisions for operable openings interlocking and mandatory controls.

Mechanical Systems

- Updated equipment efficiency requirements.
- Refinement of energy recovery ventilation requirements.
- Updated fan efficiency metric.

Electrical Power and Lighting Systems

- Increased lighting efficacy and decreased lighting power density requirements.
- New provisions for plant growth lighting.
- New provisions for automatic receptacle control.
- New provisions for energy metering and monitoring.

Additional Efficiency Requirements

- Increased number of additional efficiency options and revised structure of Section C406.

Appendices

- New Board of Appeals appendix.
- New provision for system-ready area for electrical energy storage added to Solar-Ready Zone appendix.
- New Zero Energy Commercial Building Provisions appendix.

IECC, Residential

Building Envelope

- Increased insulation requirements and reduced fenestration U-factors and solar heat gain coefficients.
- Revised air leakage requirements.
- Revised duct testing requirements.

Mechanical Systems

- Clarification on duct location and insulation requirements.
- Removed exception for duct testing in conditioned spaces.
- New mechanical ventilation system testing requirements.

Electrical Power and Lighting Systems

- New exterior lighting requirements for limited residential buildings.
- New interior lighting controls requirements.

Energy Rating Index Compliance Alternative

- ERI values have been lowered and an additional 5 percent energy reduction is applied.

Additional Efficiency Package Options

- New section requiring additional efficiency in residential buildings is added. Five options for achieving compliance with this section are included: enhanced envelope performance, more efficient HVAC equipment performance, reduced energy used in service water heating, more efficient duct thermal distribution system, and improved air sealing and efficiency ventilation system.

Appendices

- New Board of Appeals appendix.
- New Zero Energy Residential Building Provisions appendix.

In addition to these changes, the useability of the code has been improved in two ways.

- First, the 2021 IECC removes the terms “prescriptive” and “mandatory” in provision labels throughout Chapter 4 of both the Commercial and Residential IECC.
- Second, the compliance paths available to commercial and residential code users are now provided a name and the requirements of each path are clearly outlined. The code has been restructured such that each compliance path has its own section and the mandatory provisions for each are clearly identified within these sections. All requirements needed to comply with the Total Building Performance (for commercial and residential), Energy Rating Index, and Tropical Climate Region compliance paths are included in user-friendly tables separate from prescriptive code requirements.

These two changes work in tandem to clarify when code provisions are required.

Finally, the climate zone provisions have been comprehensively updated and now include a new Climate Zone 0. Ten percent of U.S. counties have been assigned a new climate zone.

Learn more about significant changes in the forthcoming 2021 International Energy Conservation Code Significant Changes and the 2021 IECC Code and Commentary at shop.iccsafe.org

SIGNIFICANT Changes to the 2021 IECC – Residential Provisions

Chapter R1 - Admin Provisions

R102.1 General: Energy Conservation is added. “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.”

R102.1.1 Applies a minimum thermal envelope backstop for “above code buildings”. This is like the ERI in 406. Uses 2009 IECC as reference

R103.2 Requires that the construction documents now specify somewhere which path of compliance was chosen for the project. (i.e. prescriptive, Total UA, Simulated Performance, ERI)

Chapter R2 Definitions

<u>Added Definitions</u>	<u>Revised Definitions</u>
Cavity Insulation	“Accessible” changed to “Access To”
Dimmer	Demand Recirculation Water System
Dwelling Unit Enclosure Area	Fenestration
Occupant Sensor Control	High-Efficacy Light Sources
On-Site Renewable Energy	“Readily Accessible” changed to “Ready Access to”
Renewable Energy Certificate (REC)	Roof Recover
Renewable Energy Resources	Skylights
Solar Fraction	
Thermal Distribution Efficiency (TDE)	

Chapter R3 General Requirements

R301 Climate Zones: Revises the Climate Zone Map and County Lists by State to match the new climate zones used in ASHRAE 90.1.

R303.1.2 Insulation mark installation: Requires insulation certificate left on site immediately after installation of a product not pre-labeled with R-Values.

Chapter R4 Energy Efficiency

Chapter 4 items listed as (Mandatory): The word mandatory was removed throughout the entire chapter. Mandatory always meant that that specific item could not be traded off if someone used a trade-off path of compliance. Instead of saying “mandatory”, a table of “required” items has been placed in the Simulated Performance Approach and the Energy Rating Index Approach to list those items that cannot be traded off in those pathways. Otherwise, all items are required if using the prescriptive approach.



R401.2 Application: Compliance section is renamed Application and just cleans it up to clarify that you must choose a path of compliance by choosing the prescriptive, Total Building Performance, Energy Rating Index or Tropical Zone pathway. Gives exception to existing buildings and clearly send them to Chapter R5.

R401.2.5 Additional Energy Efficiency: New Section is added to bring in a requirement to pick a path of compliance and then also pick an additional efficiency package on top of that to meet the efficiency requirements of the building with options to choose. This is like the additional efficiency package options of C406 for commercial (prior to 2021 edition which is now points based for commercial). See Section R407 below for the full requirements.

R401.3 Certificate: Certificate requirements are revised to require code editions to be included as well as compliance path utilized for the project. Other items that must now be disclosed on the certificate include the ERI score if applicable, the array capacity plus inverter efficiency and panel tilt/orientation. If there is more than one value for any component of the building envelope, the certificate will require both the value covering largest area and the area weighted average value if available.

Table R402.1.3 Adds an additional option for basement walls so that there is a cavity plus continuous option instead of just cavity only or continuous only. Slab insulation requirements for climate zones 3-5 are revised to increase insulation around the perimeter of the slab for CZ3 and depth of insulation from 2 to 4 feet in CZ 4 & 5. Removes footnote g that allowed you to drop down to an R-19 in the floors if the full amount would not fit. They say it is because you can use a trade-off path if you cannot get it to work prescriptively. Adds an option for cavity plus continuous insulation (R13+5) for basements and crawlspaces.

Table R402.1.2, R 402.1.3: Wall Insulation requirements are revised for all climate zones. All climate zones will have a cavity only option and a continuous only option and most climate zones will have at least one cavity plus continuous option. For Climate Zone 5, the PRESCRIPTIVE options will be R20+5, R13+10, R0+15. Ceiling insulation requirements for climate zones 2 & 3 are revised by making prescriptive values R49 instead of R38. Increases ceiling insulation in zones 4-8 from R-49 to R-60.

Fenestration: U-factor requirements in zones 3-4 are reduced to 0.30 from 0.32. Current 0.40 value in zone 2 would be restored to avoid conflict with Energy Star. Changes the Solar Heat Gain Coefficient (SHGC) in Climate Zone 5 from “not required (NR) to .40. Adds a footnote to the table that recognizes different U-Factors in high altitude climates or in windborne debris regions.

Table R402.2.6: Expands the list of wood-to-cold-formed steel equivalent R-Values.

R402.2.7 Walls with partial structural sheathing: Removed section and the allowance for less continuous insulation where structural sheathing covers 40% or less of the gross area of the exterior wall.

R402.2.7 Floors: Clarifies the intent behind the exception to the requirement that floor insulation be installed in permanent contact with the subfloor. Breaks it up into floor insulation options instead of an exception.

R402.2.9 Slab-on-grade floors: Slab-on-grade floor insulation installation is no longer a Mandatory section and allows this section to be tradeable.

R402.4.1.2 Testing: An exception is added to the air leakage testing section to address testing individual dwelling units to an optional metric of 0.30 cfm per square foot of dwelling unit enclosure area in accordance with RESNET/ICC380, ASTM E 779 or ASTM E 1827, instead of the 3 ACH/50 metric. The requirement is also changed to say that testing is mandatory, but the amount of leakage is prescriptive, meaning it can be traded off using one of the performance approaches. Finally, adds a .0 after the ACH requirement to clarify that anything over the 5.0 or 3.0 ACH/50 is non-compliant.



R402.5 Maximum fenestration U-factor and SHGC: Updates the limits put on SHGC and U-Factor that can be traded off. Also Adds an exception regarding U-Factor and SHGC for fenestration in storm shelters complying with ICC 500.

R403.3 Ducts: Section is revised to define ducts that are located within wall and floor cavities as either inside or outside the conditioned space based on how the air barrier and insulation is installed.

R403.3.1 Ducts located outside conditioned space: Section is revised to specify insulation requirements for ducts located outside conditioned space and how ducts located in floor cavities must be insulated and buried in order to be considered inside conditioned space. An additional change to this section talks to when insulating ducts buried beneath a building, how the code now allows an equivalent Thermal Distribution Efficiency (TDE) in lieu of R-Value.

R403.3.2 Ducts located in conditioned space: Criteria 3 & 4 are added to address duct work in floor cavities and duct work within exterior walls. This addresses what criteria is necessary based on how the air barrier and insulation is installed.

R403.3.6 Duct Leakage A requirement is added (by removing the exception) to mandate that all ducts be tested, including those inside the thermal envelope. Those inside the envelope can leak more than those outside of the envelope per the changes made to prescriptive section 403.3.4. Testing must be in accordance with ANSI/RESNET/ICC380 or ASTM E1554. Also, ducts serving ventilation systems are not required to be tested.

R403.5 Service hot water systems: A Water heating equipment section is added that lists allowed water heater types, as well as a table (Minimum uniform energy factor for storage gas water heaters).

R403.6.1 Heat or energy recovery ventilation: New section that will require homes in Climate Zones 6 and 7 to use an ERV or HRV unless they use a performance path for compliance.

R403.6.2 Whole-dwelling mechanical ventilation system fan efficacy: Revised to address compliance with Table T403.6.2 at rating points. Fans shall be tested with HVI Standard 916 and listed, as well as requiring the airflow be reported in the product listed or on the label.

Table R403.6.1 Ventilation Fan Efficacy Table is revised to update the efficacies of in-line and bathroom fans, Add the fan for an air handler that is integrated to the HVAC equipment (removing it from the exception), specifies how fans are rated for efficacy, and finally, changes the titles and combines some of the columns in the table to represent more of the intent.

R403.6.2 Testing: New section requiring the Testing for Mechanical Ventilation system flow rates is added as well as an Exception to address Kitchen range hoods.

R404.1 Lighting equipment: Changed from not less than 90 percent to All permanently installed lighting fixtures must be high efficacy. (see revised definition of high efficacy lamps).

R404.1.1 Exterior lighting: New section for exterior lighting of R2, R3 and R4 buildings that requires them to meet commercial exterior lighting provisions.

R404.2 Interior lighting controls: New section is brought in that will require either a dimmer, occupant sensor or other control that is built into the fixture to be installed in all lighting. But provides an exception for lighting controls in bathrooms, hallways, exterior lighting fixtures, lighting designed for safety or security. Also, a section that specifies exterior lighting controls must be automatic if over 30 watts of lighting is installed.



R405.2 Performance-based compliance: Mandatory Requirements of the simulated performance path section is revised to require that the building thermal envelope shall be greater than or equal to levels of efficiency and SHGC in Table R402.1.1 or R402.1.3 of the 2009 IECC.

R405.3.2 Compliance report: Removes the allowance for batch sampling under the simulated performance approach. This section also changed to make sure that a report based on the proposed design is submitted for permitting and a “confirmed” report is submitted prior to C.O. Clarifies the requirements that must be included in a compliance report that is submitted at plan review stage, prior to permit issuance.

R405.3.2.2 Compliance report for certificate of occupancy: clarifies the requirements that must be included in a compliance report that is submitted after final inspection and prior to C. of O.

Table R405.4.2(1) Air Exchange Rate: Table is revised to require the standard reference design and proposed design to be the same (as proposed). Also, for the Mechanical Ventilation component, the standard reference design efficacy of fans must be according to the prescriptive table in R403.6 based on the system type.

Service water heating: Revised in the performance table to give credit for a compact hot water distribution design. Additionally, the formula in the table that specifies the volume of domestic hot water usage is reduced by 15%.

Thermal Distribution System: specifies that the duct location is the same in the proposed and standard reference design. also clarifies the duct leakage to outside is the test that is used in modeling to assess the true energy penalty.

Dehumidistat (new): Establishes a method for accounting for the latent energy savings of ERVs if they are specified in the proposed design.

R406.2 ERI Compliance: Revises compliance with the ERI path to remove the backstop of the 2009 IECC and replaces it with a total UA that is within 15% of the current code edition requirement. Moved the thermal envelope backstop when using renewable energy into the code requirement instead of as a footnote in the Maximum Energy Rating Index Table. Also changed the backstop to be the 2018 thermal envelope instead of the 2015.

R406.3 Building thermal envelope (and subsections): Clarifies when on-site renewables are included in the ERI analysis that the building thermal envelope must be greater than or equal to the levels of efficiency and SHGC in the 2015 IECC.

R406.4 Energy Rating Index: Revised by adding a 5 percent cap on the trade-off credit allowed for on-site power.

Table R406.5 Table is revised to establish lower ERI target scores. CZ 1 & 2 change from 57 to 52, CZ 3 changes from 57 to 51, CZ 4 changes from 62 to 54, CZ 5 changes from 61 to 55, CZ 6 changes from 61 to 54, CZ 7 & 8 changes from 58 to 53.

R406.7.2 Compliance report: Revised to require ERI path declaration be listed on the title page of the compliance report.

R406.6.3 Renewable energy certificates (REC) documentation: Added to address who may claim the environmental attributes of an onsite-renewable energy system when using the ERI path.

R407 (and subsections) Tropical climate region compliance path: New Additional Efficiency Package Options section is added requiring you to do everything in the code that your path of compliance requires but then to also pick one of these options on top of that. It is mandatory, no matter which path you choose so it cannot be traded off. This is like the old C406 in the 2012-2018 code for commercial. Options include a 5% better Total UA



(commonly verified by REScheck), highly efficient mechanical equipment, more efficient water heating system, more efficient duct system or a more improved air sealing/ventilation combination.

[Chapter R5 – Existing Buildings](#)

Chapter 5 was reworked to remove redundant language, change sections so that they were more in order and to combine sections so that the entire chapter is more understandable and easier to navigate. It consolidates and clarifies all the provisions regarding changes from unconditioned to conditioned spaces. Significant technical changes are as follows:

- Removes requirement for additions to be air leakage tested.
- Removes requirement for duct leakage testing on duct extensions.
- Changes requirements in lighting alterations to kick in if more than 10% of the lighting is replaced instead of 50%.
- A change to 505.1 and 505.2 to require that changes of occupancy only must comply with the existing buildings chapter and not the entire code.

[Appendix RB – Solar Ready Provisions](#)

The Solar Ready Appendix in the IRC was updated in the 2018 code, but those changes did not make it into the IECC residential provisions, so the two appendices were made to match exactly. No technical changes otherwise.

[Appendix RC – Zero Energy Buildings](#)

An optional Appendix (only required if specifically adopted) to offer jurisdictions an appendix that would result in a residential building that has zero energy consumption over the course of a year by utilizing the ERI path to get to a score of zero.

SIGNIFICANT Changes to the 2021 IECC – COMMERCIAL Provisions

Chapter C1 - Admin Provisions

103.2 Information on Construction Documents: Added energy compliance path and the location of the air barrier to list of details that must be on the plans.

Chapter C2 Definitions

<u>New Definitions</u>	<u>Revised Definitions</u>
Bio Gas	Onsite Renewable Energy
Biomass Waste	Change “Accessible” to “Access to”
Data Center	Demand Recirculation Water System
Data Center Systems	General Lighting
Direct Digital Control (DDC)	Greenhouse
Electric Vehicle Supply Equipment (EVSE)	Network Guestroom Control System
Enthalpy Recovery Ratio	Skylights
EV Capable Space	Wall, Above Grade
EV Ready Space	
Fan Array	
Fan Energy Index FEI	
Fan Nameplate Electrical Input Power	
Fan System Electrical Input Power	
Fan, Embedded	
Fault Detection and Diagnostics (FDD) System	
Information Technology Equipment (ITE)	
Internal Curtain System	
Large-Diameter Ceiling Fan	
Renewable Energy Resources	

Testing Unit Enclosure Area

Thermal Distribution Efficiency (TDE)

Vegetative Roof

Visible Transmittance, Annual (VT annual)

Chapter C3 General Requirements

301.1 General: Revised Climate Zones in Figure C301.1 and Table C301.1 to update the climate zones to correspond with the release of ASHRAE Standard 169-2013".

303.1.2 Insulation Mark Installation: Revised language to require an insulation certificate on site if the R value label for insulation is not visible.

Chapter C4 Energy Efficiency

Chapter 4 items listed as (Mandatory): the word mandatory was removed throughout the entire chapter. Mandatory always meant that that specific item could not be traded off if someone used a trade-off path of compliance. Instead of saying “mandatory”, a table of “required” items has been placed in the



Performance Path Section of C407 to list those items that cannot be traded off in that pathway. Otherwise, all items not listed as (Performance) are required if using the prescriptive approach.

401.2.1 International Energy Conservation Code: One of the changes to these sections simply clarifies that there is a prescriptive path, a performance path, and then a separate Section 401.2.2 for the option of ASHRAE 90.1. The Sections tell you which code sections to comply with in each instance. Exempts out existing buildings that comply with Chapter C5. (no technical changes, only cleanup of layout)

401.2.1 #1 Prescriptive Compliance: Allows dwelling and sleeping units in R-2 buildings over 3 stories with systems that do not serve multiple units are to not be required to comply with the commercial chapter of the IECC as long as they comply with R406 Energy Rating Index path of the residential chapter.

401.3 Thermal Envelope Certificate: Adding new section to require a permanent certificate to commercial buildings that will record basic information related to the building thermal envelope like the certificate required in residential buildings.

402.1.1 Low Energy Buildings and Greenhouses: Adding the term “greenhouse” to the title of the section and removing it as an exception so that they now must comply with the code.

402.1.1.1 Greenhouses: Adding new section for conditioned greenhouses. Adding skylight and vertical fenestration U factor table to section. Provides exception for low energy use or unconditioned greenhouses.

402.1.2 Equipment buildings: Increasing sq ft of exempt buildings from 500 to 1200 sq ft. and clarifying that it is for electric equipment.

Table 402.1.3 Insulation R value Table: (appropriate matching changes made to U/C/F factor table)

Climate Zones 0 and 1: Changing R value of insulation for Joist/framing in floors from NR to R13

Climate Zone 2: no significant changes

Climate Zone 3: Changes slab edge insulation for unheated slabs from NR to R10 for 24” depth (group R)

Climate Zone 4 Except Marine: Changing R value of attic insulation from R38 to R49; Changing R value of wall insulation in metal buildings from R13 + R13 to R13 + R14; Changing R value of insulation for below grade walls from R7.5 to R10 (group R); Changing R value of insulation for mass floors from R10 to R14.6; Changing R value of insulation for mass floors from R12.5 to R16.7 (group R); Changing slab edge insulation for unheated slabs from R10 to R15.

Climate Zone 5 and Marine 4: Changing R value of attic insulation from R38 to R49 (all other occupancies), Changing R value of wall insulation in metal buildings from R13 + R13 to R13 + R14 (group R); Changing R value of insulation in metal framed buildings from R13 + R7.5 to R13 + R10; Changing R value of insulation in wood framed walls from R13 + R3.8 or R20 to R13 + R7.5 or R20 + R3.8; Changing R value of insulation for below grade walls from R7.5 to R10 (Group R); Changing R value of insulation for mass floors from R10 to R14.6; Changing R value of insulation for mass floors from R12.5 to R16.7 (group R); Changing slab edge insulation for unheated slabs from R10 to R15 and from R10 to R20 (Group R).

Climate Zone 6: Changing R value of insulation for metal building roofs from R25 + R11 to R30 + R11 (group R only); Changing R value of wall insulation in metal buildings from R13 + R13 to R13 + R14; Changing R value of insulation in metal framed buildings from R13 + R12.5; Changing R value of insulation for below grade walls from R7.5 to R10; Changing R value of insulation for Joist/framing in floors from R30 to R38; Changing R value of



insulation for mass floors from R12.5 to R16.7; Changing slab edge insulation for unheated slabs from R10 to R20 and depth to 48” for Group R only

Climate Zone 7: Changing R value of attic insulation from R49 to R60; Changing R value of wall insulation in metal buildings from R13 + R13 to R13 + R17; Changing R value of insulation in metal framed buildings to R13 + R12.5; Changing R value of insulation for below grade walls from R10 to R15; Changing R value of insulation for Joist/framing in floors from R30 to R38; Changing R value of insulation for mass floors from R15 to R20.9; Changing slab edge insulation for unheated slabs from R15 to R20

Climate Zone 8: Changing of R value of metal roof buildings to R24 + R11 + R11 LS. Changing R value of attic insulation from R49 to R60; Changing R value of wall insulation in metal framed and wood framed buildings to R13 + R18.8; Changing R value of insulation for below grade walls from R10 to R15; Changing R value of insulation for Joist/framing in floors from R30 to R38; Changing R value of insulation for mass floors from R15 to R23; Changing slab edge insulation for unheated slabs from R15 to R20 or R25 (Group R)

Table 402.1.3 Footnote g: Revised wording to add “full under” slab.

Table 402.1.4 Insulation U factor Table: Deleted multiple f factors for heated slabs and changed to one F factor to make it easier to use COMcheck.

Table 402.1.4 Footnote h: Add new footnote to require swinging door U factors to be determined in accordance with NRFC-100.

Table 402.1.4 Footnote i: Add new footnote to require specific U factors for garage doors having a single row of fenestration.

402.2.4 Slabs-on-grade: Separates out the slab on grade insulation requirements into two paragraphs. One is prescriptive and addresses R-Values that can be traded off. C402.2.4.1 now addresses the mandatory requirements of how the insulation must be installed. Removed the words “perimeter insulation” from the title because there may be requirements in some climate zones for insulation to be under the full slab as well. Exception for slab-on-grade floors greater than 24 inches is clearly stated now rather than in the body of the code.

402.2.7 Airspaces: If using an airspace in part of your R-Value calculation of a wall assembly, this section has been changed to mandatory so that the requirements must be followed. It does not make air spaces mandatory.

402.3 Roof Solar Reflectance and Thermal Emittance: Option #1 1.3 Added vegetative roofs.

Table 402.4 U factor & SHGC fenestration table: lowered most of the U factor and SHGC values for fixed and operable windows and entrance doors in climate zones 1-8. Lowered U factor and/or SHGC values for skylights in climate zones 0-3 and 7-8. Also changed SHGC values to be dependent on whether the fenestration is fixed or operable instead of by orientation.

402.4.2 Minimum Skylight Fenestration: Exception #6 added storm shelters complying with ICC 500.

Add new standard as follows.

ICC 500: ICC/NSSA Standard for the Design and Construction of Storm Shelters

402.5 Air Leakage: Brings in the requirement for dwelling and sleeping unit enclosure testing for all buildings containing group R and I Occupancies with the exception of buildings in CZ 2B, 3C, and 5C. Another change brings

in the requirement for all other buildings, other than those containing group R and I occupancies, to get building thermal envelope tested. There are also exceptions for buildings in CZ 2B, 3B, 3C and 5C to not be tested and for buildings larger than 5,000 square feet in CZ 0B, 1, 2A, 4B and 4C to not be tested and then buildings between 5,000 and 50,000 square feet in CZ 0A, 3A and 5B to not be tested. The language in C402.5.1.2 is confusing because it says that those buildings that did not test must meet the Materials or Assembly option, making it sound like you do not really have to test. It really means that those that are exempt from testing through any of the exceptions, must do either the Materials or Assembly option for the air barrier requirements. Brought in the option for another testing standard: ASTM E3158.

Add new standard as follows.

ASTM E3158-18: Test Method for Measuring the Air Leakage Rate of a Large or Multizone Building

402.5.1.5 Building Envelope Performance Verification: Brings in the requirement that all air barriers be verified or “commissioned”, and a final commissioning report be provided to the owner and code official. Verification can be by the code official, designer, or approved agency and they must verify air barrier details on the plans, inspection of air barrier and the final report.

402.5.11 Operable openings Interlocking: Creating new section that requires the heating and cooling systems to be set back automatically when occupancies utilize doors larger than 40 sq ft to be opened to the outdoors (such as roll up doors now being used at restaurants). There are exceptions for main entrance doors that are part of a vestibule or for warehouse overhead doors, if approved by the code official, and for certain separately zoned areas associated with food preparation.

Mechanical

403.1 General: Exempts data centers from the controls and economizer sections of the code. Brings in new Section C403.1.2 for the requirements of Data Centers, basically making them comply with Sections 6 & 8 of ASHRAE 90.4, with a few exceptions. For lighting requirements for the data centers, see Section C405.1.

403.2.3 Fault Detection and Diagnostics: Brings in a new Fault Detection and Diagnostics (FDD) section into the mechanical system design provisions, so that buildings with HVAC systems that serve 100,000 square feet or more of gross conditioned floor area must include the FDD system to monitor the HVAC system’s performance and automatically identify faults. **Exempts out R-1 and R-2 Occupancies.**

403.3.2 HVAC Equipment Performance Requirements: Correlating equipment and efficiencies between the IECC and ASHRAE. Removing Tables 403.3.2.(1)-403.3.2(9). Replacing with Tables 6.8.1-1 through 6.8.1-19 of ASHRAE 90.1.

403.4.1.1 Heat Pump Supplementary Heat: Revising wording to call out specific times when a heat pump can limit supplemental heat operation. Added 4 specifics.

403.4.2.3 Automatic Start and Stop: Clarifies that it’s the auto start controls that must be configured to automatically adjust the daily start time of the HVAC system and that the Automatic stop controls only have to be provided for HVAC systems with DDC of individual zones.

403.4.3.3.2 Heat Rejection: Revised option #3 to add “closed circuit” cooling towers to the requirements for heat rejection when they are used in conjunction with a separate heat exchanger to isolate the open-circuit cooling tower from the heat pump loop.



403.4.3.3.3 Two Position Valve: Revised wording to add requirement that automatic valves shall be interlocked to shut off the water flow when the compressor is off.

403.5 Economizers: Added new exception to the economizer requirements for VRF systems installed with a dedicated outdoor air system.

403.6.1 Variable air volume and multiple zone systems: Added Direct digital control to option #1 because it just said DDC but did not say what that was.

403.6.5 Supply air temp reset controls: Revised wording to add controls shall be “capable of and configured to”. Also added “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.” Revised Exception #3 by changing peak supply air quantities of 300 cfm to systems with less than 3000 cfm of design outside air for climate zones 0a, 1a, and 3a. Added new exception #4 for systems in climate zone 2a with less than 10,000 cfm of design outside air. Added new exception #5 for systems in climate zones 0a, 1a, 2a, and 3a with not less than 80% OA that has exhaust air energy recovery.

403.6.5.1 Dehumidification Control Interaction: Added new section to say “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.”

403.7.1 Demand control ventilation: added that all single-zone systems required to comply with the economizer provisions of C403.5 through 403.5.3 must also meet the DCV provisions. Revised cfm in exception 3 from 1200 to 750 cfm of design outdoor airflow but clarified that it was only multiple-zone systems that met this exception. Revised exception 4 for spaces that have more than 75% of their design outdoor airflow being required for makeup air that is exhausted or transfer air that is needed for makeup air. Deleted existing exception #5 that exempted out ventilation provided for process loads. Added new exception for spaces with one of the following occupancy classifications as defined in the IMC: correctional cells, education laboratories, barber, beauty and nail salons, and bowling alley seating areas.

403.7.2 Enclosed parking garage ventilation controls: Clarified that contamination sensing devices is now carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Revised exception 1 by changing cfm of total exhaust capacity from less than 22,500 to less than 8,000 and adding the need for occupant sensors to activate the full required ventilation rate in order to meet the exception.

403.7.4 (and subsections) Energy Recovery Systems: Prescriptively requires specific ERVs for nontransient dwelling units, offering 4 exceptions to the requirement. All other spaces to meet the current requirements for ERV systems, with a minor change to provide an enthalpy recovery ratio of not less than 50 percent and adds definition for the enthalpy recovery ratio.

403.7.6.1 Temperature setpoint controls: Revised section to add that controls shall be configured with three modes of temp control. Revised option #1 to add “guest rooms rented but not occupied”. Revised option #2 to add time restrictions for guest rooms unrented and unoccupied. Added new option #3 to add HVAC setpoints for occupied guestrooms.

403.8.2 Motor nameplate horsepower: Added two new exceptions as follows; Exception #1 for fans equipped with electronic speed control devices that vary fan inflow. Exception #2 for fans less than .89kw

403.8.5 Low capacity ventilation fans: Adding new section and exceptions to introduce exhaust fan efficacies to the commercial IECC. Adding Table 403.8.5 to reference efficacy of low capacity ventilation fans. Also adding language that efficacy shall be listed, and ventilation rates/efficacy are required at “ducted” systems. Brings it into alignment with the residential provisions.

403.9 Large-diameter ceiling fans: Requires large fans (greater than 7 feet in diameter) to be tested and labeled in accordance with AMCA 230.

Service Water Heating C404

404.2.1 High input service water heating systems: Revised percentage of thermal efficiency from 90 to 92 for a singular piece of water heating equipment that serves the entire building and the input rating of the equipment is 1,000,000 Btu/h or greater.

404.5.2.1 Water volume determination: Allows option of going to table E202.1 Internal Volume of Various Water Distribution Tubing in the IPC (now table C404.5.2.1) instead of using the current Table C404.5.1 of the IECC for determine the volume in water piping.

404.6.1 Circulation systems: Removed the wording that controls shall start the pump based on demand for hot water. Removed Item #2 in 404.6.1.1 regarding the controls limiting the temperature of entering code water piping to not greater than 104 degrees and added it to this section so that it applies to all circulations systems, not just demand recirculating systems.

Lighting C405

405.1 General: Adds that transformers, uninterruptable power supplies, motors and electrical power processing equipment in data center systems must comply with Section 8 of ASHRAE 90.4 in addition to the IECC requirements. Adds Data Centers to Table C405.3.2(2) Interior Lighting Power Allowance: Space by Space Method, so that it is found with the computer rooms in that table.

405.1.1 Lighting for dwelling units: Not new requirements but just took them out of the large general section and placed it into its own section for less confusion. And instead of referring to the residential provisions it just tells you what the requirement is in this location.

405.2.1.1 Occupant sensor control function: Added requirement for manual controls. Revised exception to clarify that the fully automatic-on controls does not mean a manual control and that auto control will be permitted in corridors, interior parking areas, stairways, restrooms, locker rooms, lobbies, library stacks and areas where manual operation would endanger occupants.

405.2.1.2 Occupant sensor control function in warehouse storage areas: Clarifies the controls required for lighting in warehouse storage areas to ensure that lighting in each aisleway is controlled separately from other aisleways and open areas, the occupant sensors automatically reduce the lighting power by 50% within each controlled area within 20 minutes of occupants leaving the area, lights that aren't turned off by occupancy sensors are turned off by a time-switch control, and a manual control is provided to allow occupants to turn the lights off themselves.

405.2.1.3 Occupant sensor control function in open plan office areas: In spaces over 300 square feet a requirement was added to only allow general lighting in control zones that are not occupied to turned on to no more than 20 percent of full power or remain off and that the general lighting in occupied control zones turn off or reduce lighting to no more than 20 percent within 20 minutes of occupants leaving the zone, but controls must



turn the lighting to their previous setting if occupancy is detected within 30 seconds of being turned off. There is a new exception added that lets you out of the requirement for the occupancy sensors in each zone if the general lighting is turned off by time-switch control. Further requirements focus on the fact that a space may also be controlled with daylight responsive controls so it is pointed out that the power used shall not exceed the lesser of either requirement.

405.2.1.4 Occupant sensor control function in corridors: Clarifies that occupancy sensors shall be required to turn the lights off within 20 minutes of occupants leaving and excepts out corridors provided with less than two foot-candles of illumination on the floor at the darkest point with all lights on.

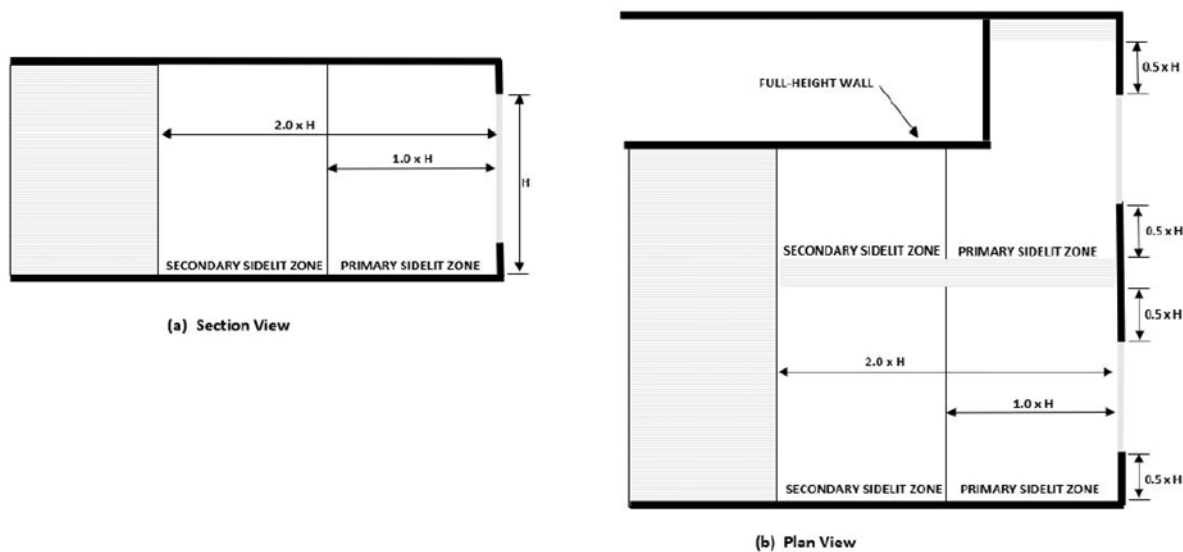
405.2.2.2 Light-reduction controls: Clarifies that light reduction controls must reduce lighting by not less than 50 percent, have an intermediate step in addition to full on/off or with continuous dimming.

405.2.3 Daylight responsive controls: Removed Equation 4-9 Adjusted interior lighting power allowance as one of the exceptions from the daylight responsive control requirements.

405.2.3.1 Daylight responsive control function: Requires that where daylight responsive controls are used they must dim lights continuously from full light to 15 percent of full light, which only applied to offices, classrooms, labs and library reading rooms before but will now apply to everywhere they are required.

405.2.4.2 Sidelit daylight zones: Added “secondary sidelit zone” requirements to the daylight responsive control requirements so that there are additional control requirements that extend past the sidelit daylight zone. Modified the measurement of the sidelit zone by changing the longitudinal measurement from 2 feet out from the edge of the fenestration to now $\frac{1}{2}$ the height from the floor to the top of the window – out longitudinally.

Better illustrated as:



**FIGURE C405.2.3.2
SIDELIT DAYLIGHT ZONE**

405.2.4.2 Sidelit daylight zones (continued): Also modified how to measure the original sidelit zone to make it more restrictive, requiring more daylighting controls, where buildings or geological formations are next to the fenestration and blocking some of the access to daylight by cutting the distance from the bottom of the fenestration to the top of the building or formation next-door in half. An exception was created to the

requirement for the daylight zones for windows with deep overhangs, by stating that the daylight zone is not established if the exterior overhang is too deep. It varies based on orientation. Measuring sidelit zones when utilizing rooftop monitors is also included in this completely reworked code section.

405.2.4.4 Atriums: New section for daylight zones in atriums.

405.2.7.3 Lighting setback: Added requirement that luminaires serving outdoor parking areas and having a rated input wattage of greater than 78 W and a mounting height of 24 feet or less above ground must have controls that automatically reduce wattage by at least 50% during any time activity isn't detected for 15 minutes or more and no more than 1,500 W of lighting power can be controlled together.

405.2.8 Parking garage lighting control: New section requires occupant sensor control or automatic time-switch shutoff, light reduction by not less than 30% when no activity detected within 20 minutes, lighting zones of no more than 3,600 sq ft, lighting used for eye adaptation at covered vehicle entrances and exits must be controlled separately by controls that automatically reduce lighting by 50% from sunset to sunrise, power to luminaires within 30 feet of the perimeter wall openings must automatically reduce in response to daylight by 50%. Exceptions where certain window to wall ratios are less than 40%, where openings are obstructed by permanent screens or architectural elements that restrict daylight from entering, and an exception similar to the sidelit daylight zone when measuring the distance when you have a building or obstruction next-door.

405.3.1 Total connected Interior lighting power: Add new exception #20 for antimicrobial lighting.

405.3.2 Interior lighting power allowance: Revised section to add requirement that unfinished spaces or projects that only involve portions of a building must use the space by space method for calculating lighting power density allowances.

405.3.2.1 Building Area method: Revised section to include a step by step method to calculate LPD allowance using the building area method.

Table 405.3.2(1) Interior lighting power allowances building area method: Revised all LPD watts per sq ft to be more in line with what is in space by space method. most wattage allowances were decreased, while a few were increased.

405.3.2.2 Space by space method: For unfinished spaces that must use the space by space method, the LPD allowance shall be the total connected lighting power or .2 watts per square foot, whichever is less. Also, like 405.3.2.1, this section was revised to include a step by step method to calculate LPD allowance using the space by space method.

Table 405.3.2(2) Interior lighting power allowances space by space method: Revised LPD watts to increase stringency/reduce wattage in most space types

405.4 Lighting for plant growth and maintenance: New section requiring that at least 95% of the permanently installed luminaires used for plan growth and maintenance have specific higher efficiency lighting as defined in accordance with ANSI/ASABE S640.

405.5.2 Exterior lighting power allowance: This section was revised to include a step by step method to calculate LPD allowance for exterior lighting.

405.9.2 Escalators and moving walks: Requirement for automatic controls that reduce speed is as permitted in accordance with ASME A17.1/CSA B44 and applicable local codes and removes the dependency for whether they are conveying passengers or not.

405.9.2.1 Energy Recovery: Revised title of section from “regenerative drive” to “energy recovery”. Revised language to require escalators to be designed to recover, on average, more power than is consumed by the energy recovery feature of its motor controller system where a traffic analysis indicates that an escalator application will have sufficient periods in down direction with passengers whose combined weight exceeds 750 pounds.

405.11 Automatic Controlled Receptacles: Enclosed offices, conference rooms, rooms used primarily for copy or print functions, breakrooms, classrooms, and individual workstations, including those installed in modular partitions and module office workstation systems shall be required to have at least 50% of all 125 V, 15 and 20 amp receptacles be “controlled receptacles” either split controlled (top receptacle controlled) or shall be located within 12 inches of each uncontrolled receptacle and those controlled receptacles must turn the receptacle power off by either a scheduled basis using time-of-day operations, an occupancy sensor control that shuts the receptacle off within 20 minutes of occupants leaving the space, or an automated signal from another control or alarm that turns receptacles off within 20 minutes of determining the space is unoccupied. Controls must be permanently marked, and plug-in devices do not comply. Exception for receptacles specifically designated for equipment requiring continuous 24/365 operation or where automatic control would endanger safety or security of occupants or building.

405.12 (and subsections) Energy Monitoring: Added new mandatory requirement to measure/monitor/record/report energy consumption in new buildings with gross conditioned floor area of 25,000 square feet or larger. Added exceptions for R-2 occupancies and individual tenant spaces that have their own utility services and meters and have less than 5000 square feet of conditioned floor area.

C406 Additional Efficiency Package Options

406 Additional Efficiency Package Options: Completely redid this entire section of the code to make it into a point-based system, requiring new buildings to achieve a total of 10 credits from the various tables. If a building has multiple uses then the floor area must be weighted by the area of each group to determine the weighted average of credits. Points are based on climate zones and use of the building, giving more weight to more efficient cooling equipment, for instance, in hotter, cooling dominated climates, while more credit for better heating strategies in colder climates. There are points for things like renewables, renewable credits, lighting, air leakage, better envelopes, efficient kitchen equipment, and water heating as well. Spaces not required to have energy monitoring or fault detection and diagnostic (FDD) may get points for providing some or all of them, however, if you are required to have one of those requirements per a different section of this code then you will not be allowed to get the point credit here. Tenant spaces are required 5 credits if the core building did not have to comply.

C407 Performance

Section 407 was revised to add a new table that specifies all the code sections that must be complied with and cannot be traded off (formerly known as Mandatory). The word mandatory was removed from the code and this table was put in place in the only place you could trade things off anyway – the performance section.

C407.2 Mandatory requirements: Energy cost of the proposed building must be less than or equal to 85% of the annual energy cost of the standard reference design. Added Data system prices and expenditures reports to charging statement.



Table 407.4.1(1) Specs for the standard reference design: Correlating equipment and efficiencies between the IECC and ASHRAE. For the heating system efficiencies, removing Tables C403.3.2(4) and C403.3.2(5) and replacing with tables specified in Section C403.3.2. For cooling system efficiencies, removing Tables C403.3.2(1) - C403.3.2(3) and replacing with tables specified in Section C403.3.2. Removed mass walls and steel framed walls from the standard reference design so that all walls are looked at as proposed, to take away extra credit given to wood framed walls.

Chapter C5 – Existing Buildings

Chapter C5 was reworked to clarify that existing buildings were meant to comply with the provisions of the existing buildings chapter and its appropriate section, depending on whether the project is an addition, alteration or repair, and not be brought into compliance with the full code.

Significant changes to note:

- **C502.2** Changes in space conditioning shall comply with Section C502 and not the whole code
- C502.3.3 New mechanical systems or lighting systems must comply with C408 commissioning requirements where applicable.
- C503.2.1 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 a roof replacement.

Appendix CB – Solar Ready

CA103.6 Interconnection pathway: Revised wording to add electrical energy storage system area.

CA103.7 Electrical energy storage system-ready area: Added new section and requirements for not less than a 2ft by 4ft area for electrical energy storage system-ready area and correlate with IFC on location.

CA103.8 Electrical service reserved space: Revised wording to add dual-pole circuit breaker for future electrical energy storage system installation.

Appendix CC – Zero Energy Commercial Building Provisions

Created a new appendix that gives jurisdictions the option of having a path to Zero energy, like the zEPI that is in the 2015 IgCC. It is meant to supplement the IECC and require renewable energy systems of adequate capacity to achieve net zero carbon. It is not a requirement unless specifically adopted by a jurisdiction.

AGENDA ITEM #5



Sustainability Advisory Board Meeting Minutes

Tuesday April 18, 2023

1. Call to Order and Roll Call

The meeting was called to order at 5:04 p.m. and Sustainability Advisory Board (SAB) members present were Vicki Hawse, Angela Hawse, Dave Jones, Dana Ivers, JT Thomas and Ken Mihelich. Joyce Huang was absent. Staff representative Debra Overton was also present.

2. Presentation by Emma Gerona, Executive Director of EcoAction Partners re: Regional Climate Action Plan (CAP)

Emma gave an introduction to the CAP and discussed timelines, why the CAP is important, the current greenhouse gas inventory and forecasting, she also reviewed the CAP objectives and actions. There was a brief question and answer period. Dave made a motion recommending that the Ridgway Town Council adopt the Regional Climate Action Plan. Ken seconded the motion and the motion carried unanimously by members present.

3. Webpage layout, content and implementation

Ken and Dave presented the draft webpage and asked for input from the Board on the layout and content. The Board suggested that the Town logo and the SAB banner be at the top of each page. There was discussion on modifying drop down menus and adding additional links. Ken and Dave agreed to make the suggested changes and present another draft version at the next meeting.

4. Approval of minutes from February 1, 2023 and March 1, 2023 regular meetings. Approval of minutes from the March 9, 2023 work session.

Angela made a motion to approve the meeting minutes from the February 1st, March 1st, and March 9th 2023 meetings. Ken seconded the motion and the motion carried unanimously by members present.

5. Adjournment

There being no further business to come before the SAB, the meeting was adjourned. The time was 6:54 p.m.