

SIGNIFICANT Changes to the 2021 IECC – Residential Provisions (Pre-code publication version)

The Mozingo Code Group LLC

(not all changes listed here, just more significant changes)

Chapter R1 - Admin Provisions

R102.1 Energy Conservation is added to the General section. “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

Added Definitions

Cavity Insulation
Continuously Burning Pilot Light
Dimmer
Dwelling Unit Enclosure Area
Electric Vehicle Supply Equipment
EV Capable Space
EV Ready Space
Grid-Enabled Water Heater
Mass Timber
Occupant Sensor Control
On-Site Renewable Energy
Renewable Energy Certificate (REC)
Renewable Energy Resources
Solar Fraction
Thermal Distribution Efficiency (TDE)

Revised Definitions

Air Permeable Insulation
“Accessible” changed to “Access To”
Demand Recirculation Water System
Fenestration
High Efficacy Lamps
Mass Timber
“Readily Accessible” changed to “Ready Access to”
Roof Recover



Chapter R3 General Requirements

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

R303.1.2 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 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.

R401.2.1 New Section: Additional Energy Efficiency (Mandatory) 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 mandatorily get more efficiency from the building but giving you options to choose on how to get there. This is like the additional efficiency package options of C406 for commercial (prior to 2021 edition which is now points based for commercial). See also Section R407 below for the full requirements. This section just sends you there.

R401.3 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 R402.1.2 Adds an additional option for basement walls so that there is a cavity plus continuous option instead of just cavity only or continuous only.

Table R402.1.2 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.

Table 402.1.2 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.

Table R402.1.2, R 402.1.4 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

Table R402.1.2, R402.1.4 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.

Table R402.1.2, R402.1.4 Fenestration: U-factor requirements in zones 3-4 are reduced to .30 from .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 R402.1.2 Adds an option for cavity plus continuous insulation (R13+5) for basements and crawlspaces.

Table R402.2.5 Expands the list of wood-to-cold-formed steel equivalent R-Values.

R402.2.7 removes the allowance for less continuous insulation where structural sheathing covers 40% or less of the gross area of the exterior wall.

R402.2.8 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.

R402.2.10 Slab-on-grade floor Insulation Installation is no longer a Mandatory section and allows this section to be tradeable.

R402.4.1.2 An exception is added to the air leakage Testing section to address testing individual dwelling units to an optional metric of .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 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 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 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.

R403.3.3 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.

R403.3.7 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.

R403.5.1 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 Whole House Mechanical Ventilation System Fan Efficacy section is revised to address compliance with Table T403.6.1 at one or more 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.

R403.6.1? 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. (code section unknown because there were multiple new R403.6.1 sections proposed.)

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

R404 Adding requirements for EV charging in new construction, One to two family dwellings, townhouses and multifamily dwellings. This will require that a new building has either electric vehicle supply equipment, EV capable spaces or EV ready spaces, or a combination thereof, as it is projected that the number of EV vehicles will increase in the next 10 years.

R404.1 Lighting equipment (Mandatory)_Requirement is 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 New section for exterior lighting of R2, R3 and R4 buildings that requires them to meet commercial exterior lighting provisions.

R404.2 New section Lighting Controls (Mandatory) 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.

R404.2 and subsections?? (multiple new proposals with 404.2 as the number so this number may change) New section and subsection for Electric readiness (Mandatory) is added. Requires that wherever there is a gas or propane water heater, dryer or stove/oven there must be a dedicated and specific outlet installed nearby, requires that the unused conductors be labeled as well as a single pole circuit breaker space reserved and labeled and also requires an indoor space at least 3x3x7 be available within 3 feet of the water heater unless using a heat pump water heater.

R405.2 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.

R405.4.2 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.

R405.4.2.1 clarifies the requirements that must be included in a compliance report that is submitted at plan review stage, prior to permit issuance.

R405.4.2.2 clarifies the requirements that must be included in a compliance report that is submitted after final inspection and prior to C. of O.

Table R405.5.2(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.

Table R405.5.2(1) service water heating is 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%.

Table R405.5.2(1) 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.

Table R405.5.2(1) Dehumidistat (new) Establishes a method for accounting for the latent energy savings of ERVs if they are specified in the proposed design.

R406.2 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 requirements

R406.2 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 Energy Rating Index section is revised by adding a 5 percent cap on the trade-off credit allowed for on-site power.

Table R406.4 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.

R406.6.2 Compliance report section is revised to require ERI path declaration be listed on the title page of the compliance report.

R406.6.3 Renewable energy certificates documentation section is added to address who may claim the environmental attributes of an onsite-renewable energy system when using the ERI path.

R407 and subsections 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 RA – Solar Ready

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 RB – Net 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.