Utah Residential Energy Code Quick Guide

New or significant changes in 2021 Code - Blue Text
IECC Res. Section #'s (green) all begin with R
IRC Chapter 11 Energy Section #'s all begin with N
Utah Amended, Added, or Deleted Sections - Red Text

This guide is a summary of selected sections of the Utah Residential Energy Code. Please refer to the 2021 IECC and IRC for details.

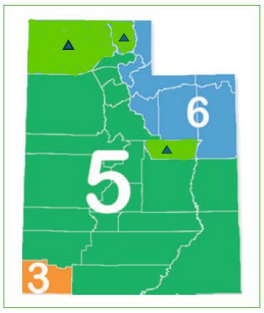
R401.2 (N1101.1.3) Compliance Options
Note: R401.2.5 The 2021 IECC requires selection of one of five additional Energy Efficiency Packages, applicable to any compliance options - deleted by state amendment.

1. 2021 Prescriptive Tables:
   a. R402.1.2 – U-factor
   b. R402.1.3 – R-value
2. 2021 REScheck
3. Utah 2012 REScheck-pass rate of 5% or better
4. Total Building Performance - R405 (N1105)
5. ERI (Energy Rating Index) – R406 (N1106)
   a. Required minimum scores amended
6. R102.1.1 National Green Building Standard – comply ICC 700-2020 National Green Building Standard – with a Gold Rating

R103.2 (N1101.5) Construction Documents
Construction documents include energy code compliance and mechanical design. Specific limits. (Utah Code 10-5-132) U-factors, R-value and other pertinent data must be shown and identical on plans, energy compliance reports, and HVAC design documents.

R202 (N1101.6) Definitions
CONTINUOUS AIR BARRIER. A combination of materials and assemblies that resist or prevent the passage of air through the building thermal envelope.
CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members penetrated only with fasteners and service openings. Installed on the exterior or interior. Attic insulation batts & blown in trusses is cavity insulation, not ci.
CAVITY INSULATION. Insulation located between framing members.
RESIDENTIAL BUILDING. One- and two-family dwellings, townhouses, and Group R-2, R-3 and R-4 buildings, 3 stories or less in height above grade plane.

R301.1 (N1101.7) Utah Climate Zones. Box Elder, Cache, & Carbon Counties changed from CZ-6 to CZ-5 in 2021 Code



R303.1.3 (N1101.10.3) Fenestration Product Rating. Determined in accordance with NFRC or EN-14351-1:2006+A:2010 standards.

R303.3 (N1101.12) Maintenance information. Maintenance instructions shall be furnished for equipment and systems requiring maintenance. (Installation instructions include this). Readily visible label requirement deleted by amendment.

R401.3 (N1101.14) Certificate. Permanent certificate listing thermal performance factors and values, testing results, sizes and efficiency of heating, cooling, and water heating equipment, PV details, ERI scores, and code edition. Energy code compliance path deleted.

R-Value Prescriptive Table **R402.1.3 (N1102.1.3)**

Climate Zone and Subtype	3 - B	5 - B	6 - B
Wood Frame Wall R-value*	20+0ci or 13+5ci or 0+15ci	21+0ci or 15+5ci or 0+15ci	21+0ci or 15+11ci or 11+5ci
Fenestration U-factor*	0.32	0.32	0.32
Skylight U-factor*	0.55	0.55	0.55
Glazed SHGC Fenestration*	0.35	0.40	NR
Ceiling R-value	38	49	49
Basement Wall R-value*	5ci or 13	15+0ci or 0+11ci or 11+5ci	19+0ci or 0+13ci or 11+5ci
Mass Wall R-value*	8/13	13/17	15/20
Floor R-value	19	30	30
Crawlspace Wall R-value*	5ci or 13	15+0ci or 0+11ci or 11+5ci	19+0ci or 0+13ci or 11+5ci
Slab R-value* and depth (Add R-5 if heated slab)	NR	10-2′	10-4′

*See 2021 table footnotes

R402.2.1.1 (N1102.2.1.1) (new section added by amendment) **Unvented Attic & Unvented Rafters.** Exception for reduced R-value air impermeable insulation, conforming with IRC806.5, exposed rafter covered with minimum R-3, provided blower door tested air leakage ≤ 2.5ACH50, whole house mech. ventilation, and all HVAC inside thermal envelope.

R402.2.1.3 (N1102.2.2.1?) Walls with Air-impermeable Insulation. R-15 in CZ3 & CZ5 and R-20 in CZ6, complies with Table R-402.1.2 provided blower door test at ≤ 2.5ACH50.

R402.2.9 (N1102.2.9) Slab-on-Grade Floors. Slab floor less than 12" below grade.

- Insulate in accordance with Table R402.1.3 (N1102.1.3).
- NO REScheck Tradeoff allowed.
- Garage to conditioned dwelling slabs often missed.

R402.2.9.1 (N1102.2.9.1) Slab-on-Grade Floor Insulation Installation.

- From Top of slab, garage slabs and dwellings.
- Code allows cut at 45 degrees or top 4" (thickness of slab) thermal break material ¼" minimum thickness

R402.2.4.1 (N1102.2.4.1) Access Hatches and Doors Insulation & Retention

- Must be weather stripped.
- Must have insulation of required R-value attached to the panel.
- Insulation dam required around access opening.
- Access that prevents insulation compression to all equipment.
- Baffles and retainers as need to maintain full insulation depth over conditioned space, such as transitions to unconditioned areas.
- Vertical access doors must meet fenestration requirements – Tables R402.1.2 & R402.1.3 (N1102.1.2 & N1102.1.3).

R402.2.12 (N1102.2.12) Sunroom and Heated Garage Insulation. If thermally isolated from home, with code complaint separation walls, reduced R-value and U-factors to exterior allowed.

- Attic Minimum - CZ 3: R-19, CZ 5 & 6: R-24
- Wall Minimum – R-13 all CZs
- R402.3.5 (N1102.3.5) – Fenestration U-factor ≤ 0.45, Skylights ≤ 0.70

R402.4 (N1102.4) Air Leakage. The Building Thermal constructed to limit air leakage.

- R402.4.1.1 (N1102.4.1.1) Install components per Table R402.4.1.1 (N1102.4.1.1) Air Barrier, Air Sealing, & Insulation checklist, AND
- R402.4.1.2 (N1102.4.1.2) Blower Door Testing (Will be amended to option of Table or BD Test in 2025 Legislative Session) AND
- R402.4.1.3 (N1102.4.1.3) Leakage Rate not exceeding 4.0 ACH50 in any climate zone.

Table R402.4.1.1 (N1102.4.1.1) Summary (see Code for details)

- Insulation and air barriers installed in accordance with manufacturer's instructions.
- Air-permeable insulation (fiberglass, rock-wool, cellulose) is not used for air sealing.
- Closed-cell foam is the only insulation that also serves as an air barrier.
- Continuous air barrier installed at the building thermal envelope. Breaks & joints sealed.
- Dropped ceilings/soffits, shafts, and chases shall be capped with an air barrier lid and sealed (attic insulation does not drop down into soffits).
- Walls shall be framed to allow insulation in corners and in headers.
- Wall insulation shall be enclosed on 6 sides. Includes an air barrier, backside of knee-walls.
- Wall batt insulation shall be cut all pipes, wiring and boxes in cavity (recommend blown insulation).
- All gaps and voids sealed between conditioned and un-conditioned spaces, including garages, crawlspaces, around windows and doors, and all penetrations.
- Rim joist insulation shall include a sealed air barrier on the inside face of insulation, or closed cell spray foam.
- Floor insulation in contact with sheathing/lid below. Air barrier underside of cantilevers. Fill floor cavities – rooms over garages.
- Recessed can lights, boxes and HVAC boots penetrating the thermal envelope shall be sealed.
- Air barrier behind electrical boxes or closed cell foam, caulk, gaskets, or air sealed boxes.
- Exterior walls adjacent to fireplaces, tubs, showers shall include an inside surface air barrier.

IRC- R806.5 Unvented Attic and Unvented Enclosed Rafter Assemblies (NOT in the IECC). Air-impermeable insulation, closed cell spray foam or rigid foam board, required on the cold side of the roof assembly for condensation control- Table R806.5.

- Climate Zone 3 – R-5
- Climate Zone 5 – R-20
- Climate Zone 6 – R-25

• Balance of required insulation may be air permeable.

R402.4.2 (N1102.4.2) Fireplaces. Wood burning - tight fitting flue-dampers or doors, & outdoor combustion air) - listed and labeled doors, UL 127.

R402.4.4 (N1102.4.4) Rooms Containing Fuel Burning Appliances. Where open combustion air ducts serve open combustion, fuel burning appliances:

- The open duct and appliance shall be enclosed in a sealed and insulated room, isolated from inside the thermal envelope.
- Combustion air duct passing through conditioned space shall be insulated to a minimum R-8.
- Exceptions: Direct vent appliance, Fireplaces and Stoves installed per code.

R402.4.5 (N1102.4.5) Recessed Lighting.

· IC-rated and labeled, air leakage rate 2 cfm max.
· Gasketed or caulked at the ceiling.

R402.4.6 (N1102.4.6) Sealed Elect. & Comm. Outlet Boxes. Deleted

R402.5 (N1102.5) Maximum Fenestration U-factor and SHGC.

· Area-weighted average maximum **U-factor** when using REScheck or Performance: CZ 5: 0.48, CZ 6: 0.40.
· Area-weighted average maximum **SHGC** when using REScheck or Performance: CZ 3: 0.40

R403.3.1 (N1103.3.1) Duct Located Outside Conditioned Space. Insulated to a minimum R-8 if ≥ 3", R-6 if < 3". In other portions of the building minimum R-6 if ≥ 3", R-4.2 if < 3". Exception: ducts or portions located completely inside the thermal envelope.

R403.3.2 (N1103.3.2) Ducts Located in Conditioned Space.

- In the thermal envelope, if in FLOOR cavities over unconditioned with specific air barriers and cavity insulation.

R403.3.3 (N1103.3.3) Ducts Buried in Ceiling Insulation. Deleted

R403.3.3.1 (N1102.3.3.1) Effective R-value, Deeply Buried Ducts. Deleted

R403.3.4 (N1103.3.4) Duct Sealing. Ducts, air handlers, and filter boxes sealed per IRC/IMC

R403.3.5 (1103.3.5) Duct Testing. All heating and cooling ducts require testing. Removed Testing by BPI or RESNET certified parties or licensed contractors by test equipment manufacturers or comparable.
Exceptions:

- Ducts serving ventilation system not integral with heating and cooling systems.
- No air handler or ducts outside the thermal envelope.

R403.3.6 (N1103.3.6) Duct Leakage.

- Rough-in test: total leakage ≤ 6 CFM per 100 sq. ft. conditioned floor area with air-handler in place, without air handler ≤ 5 CFM.
- Post Construction test: total leakage ≤ 5 CFM per 100 sq. ft. conditioned floor area. (May be reversed)

R403.3.7 (N1103.3.7) Building Cavities Shall not be used as ducts or ~~plenums.~~

R403.4 (N1103.4) Mechanical System Piping Insulation insulate to R-3 min.

R403.5.1 (N1103.5.1) Circulating and Demand Hot Water Systems

- R403.5.1.1 (N1103.5.1.1) Where installed – Recirculation systems not mandatory
- Automatic controls- time or demand sensing
- Demand recirculation systems maximum return temperature

R403.5.2 (N1103.5.2) Hot Water Pipe Insulation R-3 insulation required:

- ¾" or larger nominal diameter.
- Piping serving more than one dwelling
- Piping outside conditioned space.
- Piping from water heater to distribution manifold
- Piping under floor slab – previously deleted
- Buried piping – previously deleted
- Supply and return piping in circulation and recirculation systems.

R403.6 (N1103.6) Mechanical Ventilation Per IRC 303.4 and M1507 with automatic or gravity dampers on outdoor air intake and/or exhaust. If ≤ 3 ACH 50 must be mechanically ventilated.

R403.6.3 (N1103.6.3) Testing (Mech. Ventilation Systems). Deleted

R403.6.2 (N1103.6.2) Whole-house Mech. Ventilation System Fan Efficiency

- Fans meet Table efficiency requirements
- If air handler in system – ECM motor

TABLE R403.6.2 (N1103.6.2)
MECHANICAL VENTILATION SYSTEM FAN EFFICACY

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINUMUM EIFFICACY (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
HRV or ERV	Any	1.2 cfm/watt	Any
Range hoods	Any	2.8 cfm/watt	Any
In-line fan	Any	2.8 cfm/watt	Any
Bathroom, utility room	10	1.4 cfm/watt	90
Bathroom, utility room	90	2.8 cfm/watt	Any

R403.7 (N1103.7) Equipment Sizing
Per ACCA Manual S, based on loads calculated per ACCA Manual J. Ducts per ACCA Manual or other methodologies. By individuals qualified by completing training from one of the following:
- ACCA
- Recognized educational institution
- HVAC equipment manufacturer's training
- Other recognized industry certification

R403.9 (N1103.9) Snowmelt Controls
Mandatory controls- Auto shutoff: no moisture, pavement temp > 50°F, or air temp < 40°F.

R403.10 (N1103.10) Pools and In-Ground Spas Readily accessible shutoff switches for heaters (R403.10.1) and timers for pumps and heaters (R403.10.2), AND vapor-retardant covers for all pools (R403.10.3) and pool cover if heated (see exceptions & referenced APSP standards).

R404.1 (N1104.1) Lighting. A minimum of 90% of permanent fixtures contain high efficacy light sources.

R404.1.1 (N1104.1.1) Exterior Lighting – Deleted
R404.2 (N1104.2) Interior Lighting Controls – Deleted
R404.3 (N1104.3) Exterior Lighting Controls – Deleted

R405 (N1105) Total Building Performance. Third Party Computer modeling, showing proposed home is more efficient than Standard Reference Design home. **Significant 2021 Changes.** Must be documented, including details indicated plans.

R406 (N1106) Energy Rating Index (ERI) Compliance Alternative. Third Party HERS rater uses modeling to generate an ERI or HERS score, equal to or lower than the required score for the applicable Climate Zone.
- Climate Zone 3 – 65
- Climate Zone 5 – 69
- Climate Zone 6 – 68

R406.3 (N1106.3) Building Thermal Envelope (ERI Compliance Alternative). All Sections Extensively Modified – See amendments.

R406.3.1 (N1106.3.1) On Site Renewables are not Included. Deleted

R406.3.2 (N1106.3.2) On Site Renewables are Included. Deleted

SECTION R408 (N1108) ADDITIONAL EFFICIENCY PACKAGE OPTIONS
R408.1 (N1108.1) Scope. This section establishes additional efficiency package options to achieve additional energy efficiency in accordance with Section R401.2.5. Deleted
- **R408.2.1 (N1108.2.1) Enhanced envelope performance option. Deleted**
- **R408.2.2 (N1108.2.2) More efficient HVAC equipment performance option. Deleted**
- **R408.2.3 (N1108.2.3) Reduced energy use in service water-heating option. Deleted**
- **R408.2.4 (N1108.2.4) More efficient duct thermal distribution system option. Deleted**
- **R408.2.5 (N1108.2.5) Improved air sealing and efficient ventilation system option.**

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This Quick Guide is the Initial Draft based on the 2021 IECC Residential Provisions/2021 IRC Chapter 11 and 2024 Legislative Amendments adopted July 1, 2024. Please send corrections, comments, and suggestions to bursenbach@gmail.com

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