Energy Code Guide for Residential Projects in Utah

2015 International Energy Conservation Code (IECC)

Utah Amended Sections in Red text

R401.2 Compliance Options

1. 2015 Prescriptive Table R402.1.2
2. Total UA Alternative – 2015 REScheck - R402.1.5
3. Simulated Performance Alternative – R405
4. ERI (Energy Rating Index) - HERs Score – R406
5. 2012 Utah REScheck – pass rate of 3% better than code, increasing to 4% on Jan. 1, 2019 and 5% on Jan. 1, 2021

R103.2 Construction Documents
U-factors, R-value and other pertinent data must be shown and identical on plans, energy compliance reports, and HVAC design documents. Construction documents include all documentation required to be submitted in order to issue a building permit.

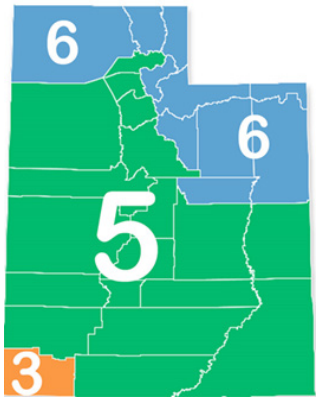
R202 Definitions
CONTINUOUS AIR BARRIER. A combination of materials and assemblies that resist or prevent the passage of air through the building thermal envelope.

CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members penetrated only with fasteners and service openings. – Attic insulation in trusses is cavity, not ci.

CAVITY INSULATION. Insulation installed between wood studs, metal framing, channels, or z-clips.

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 Utah Climate Zones by County



R401.3 Certificate
Permanent certificate listing performance values, factors, and ratings for all building thermal envelope components, shall be posted in approved location.

Prescriptive Table R402.1.2

Climate Zone and Subtype	3 - B	5 - B	6 - B
Crawl Space Wall R-value*	5/13	15/19*	15/19*
Fenestration U-factor*	0.35	0.32	0.32
Skylight U-factor*	0.55	0.55	0.55
Glazed SHGC Fenestration*	0.25	NR	NR
Ceiling R-value	38	49	49
Wood Frame Wall R-value*	20 or 13+5	20 or 13+5	20+5 or 13+10
Mass Wall R-value*	8/13	13/17	15/20
Floor R-value	19	30	30
Basement Wall R-value*	5/13	15/19	15/19
Slab R-value* and depth (Add R-5 if heated slab)	0	10-2′	10-4′

*See footnotes in 2015 IECC

R402.2.4 Access Hatches and Doors

- Must be weather stripped.
- Attic hatch must have insulation of required R-value attached to the panel.
- Insulation dam required around access opening.
- Vertical access doors must meet fenestration requirements - Table R402.1.2.

R402.4 Air Leakage
The components of the Building Thermal Envelope as listed in Table R402.1.1 shall be installed in accordance with the manufacturer's instructions.

R402.4.1 Building Thermal Envelope
Comply with all items in Table 402.4.1.1 OR Blower Door Test per R402.4.1.2.

1st Option
R402.4.1.1 Air Barrier and Insulation Installation and Inspection per Table R402.4.1.1.

Table R402.4.1.1 Summary

- Insulation and air barriers installed in accordance with manufacturer's instructions.
- Continuous air barrier installed at the building thermal envelope.

- All gaps and voids sealed between conditioned and un-conditioned spaces.
- 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.
- 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 neatly to fit wall cavities and around all pipes, wiring and boxes in cavity (recommend blown insulation).
- Rim joist insulation shall include a sealed air barrier on the inside face of insulation, or closed cell spray foam.
- Recessed can lights, boxes and HVAC boots penetrating the thermal envelope shall be sealed.
- Exterior walls adjacent to fireplaces, tubs, showers shall include an inside surface air barrier.
- Air sealing shall be provided between the garage and conditioned spaces.
- Floor insulation in contact with underside of floor or topside of sheathing/lid below.
- Air barrier underside of cantilevers.

2nd Option

R402.4.1.2 Blower Door Testing and Third-Party Verification

- ≤ 5 ACH50
- ≤ 3.5 ACH50 beginning Jan. 1, 2019
- ≤ 3.0 ACH50 beginning Jan. 1, 2021
- Testing by BPI or RESNET certified parties or licensed contractors with approved training.

***Townhouses, other multi-family remain 5 ACH50 effective March 2019.

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, must be installed on the cold side of the roof assembly for condensation control- Table R806.5.

R402.4.2 Fireplaces
Tight-fitting dampers and outdoor combustion air (wood-burning only); listed and labeled doors, UL 127 or UL 907.

R402.4.4 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 Recessed Lighting
- IC-rated and labeled, air leakage rate 2 cfm max.
- Gasketed or caulked at the ceiling.

R402.5 Maximum Fenestration U-factor and SHGC
- Area-weighted average maximum U-factor for total UA - alternative or simulated performance approach:
  - ≤ 0.48 for CZ 5B
  - ≤ 0.40 for CZ 6B
- Area-weighted average maximum SHGC for total UA - alternative or simulated performance approach:
  - ≤ 0.50 for CZ 3B

R403.3.1 Duct Insulation
Outside thermal envelope, both return and supply.
- Ducts in attic- R-8
- Ducts in other areas- R-6

R403.3.2 Duct Sealing and Testing
Ducts, air handlers and filter boxes sealed per IRC/IMC AND tested if air handler is outside the thermal envelope, or at least 35% of duct is outside thermal envelope.
- 25% outside the envelope- Jan. 1, 2019
- 20% outside the envelope- Jan. 1, 2021
- Testing by BPI or RESNET certified parties or licensed contractors, approved training.

R403.3.4 Duct Leakage
Rough-in or post-construction testing
- ≤ 8 cfm/100 sf, with air handler
- ≤ 7 cfm/100 sf, Jan. 1, 2019
- ≤ 6 cfm/100 sf, Jan. 1, 2021*
- ≤ 6 cfm/100 sf, w/o air handler*

R403.3.5 Building Cavities
Shall not be used as ducts or ~~plenums~~

R403.4 Mechanical System Piping Insulation
Carrying fluids > 105°F or < 55°F, insulate to R-3 min.

R403.5 Circulating and Demand Hot Water Systems
- Automatic controls- time or demand sensing
- Demand recirculation systems- maximum return temperature- 104°F.

R403.5.3 Hot Water Pipe Insulation
R-3 (some exceptions)

R403.6 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.

R403.7 Equipment Sizing
Per ACCA Manual S, based on loads calculated per ACCA Manual J. Ducts per ACCA Manual D.

R403.9 Snowmelt Controls
Mandatory controls- Auto shutoff: no moisture, pavement T > 50°F and air T > 40°F.

R403.10 Pools and In-Ground Spas
Readily accessible shutoff switches for heaters (R403.10.2) and timers for pumps and heaters (R403.10.3), AND vapor-retardant covers for all pools (R403.10.4) and pool cover if heated (see exceptions).

R404.1 Lighting
A minimum of 75% of permanently installed fixtures must have high-efficacy lamps.
- Compact fluorescent lamps (CFL), tubes T8 or smaller, or LED (Low Voltage exempt)

R405 Simulated Performance Alternative
Third Party Computer modeling, showing proposed home is more efficient than standard reference design home.

R406 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

Produced by Brent Ursenbach, Salt Lake County Planning and Development Services with funding from the Utah Governor's Office of Energy Development, Dominion Energy and Rocky Mountain Power.