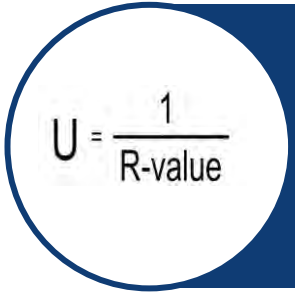
CARLISLE
SPRAY FOAM INSULATION

HOW TO ACHEIVE CODE COMPLIANCE

Learning Objectives

Prescriptive Method

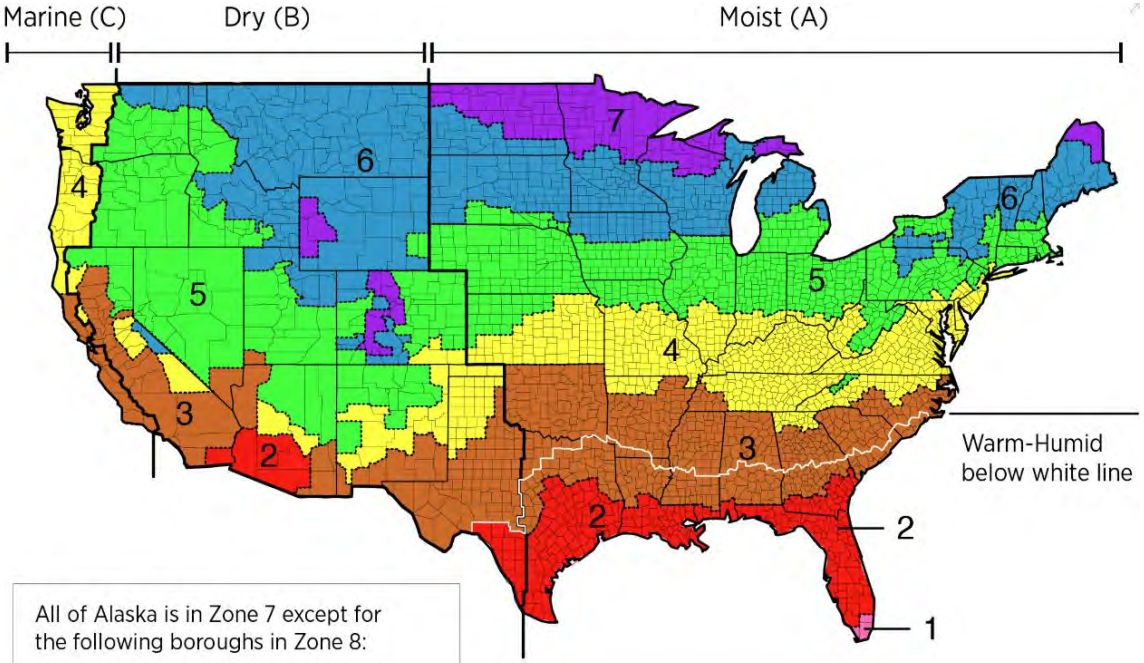


U-Value R-Value

Performance Energy Rating Index

State Specific Codes

KNOW YOUR CLIMATE ZONES



All of Alaska is in Zone 7 except for the following boroughs in Zone 8:

Bethel, Northwest Arctic, Dellingham, Southeast Fairbanks, Fairbanks N. Star, Wade Hampton, Nome, Yukon-Koyukuk, North Slope

Zone 1 includes Hawaii, Guam, Puerto Rico, and the Virgin Islands

R-Value = ASTM C518

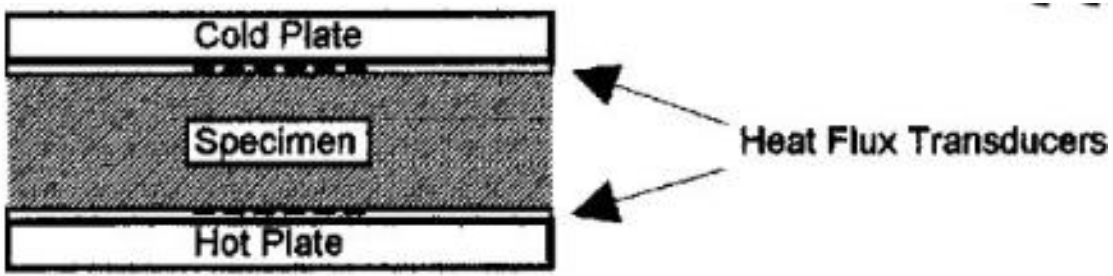


FIG. 3 Apparatus with Two Heat Flux Transducers and One Specimen

NOTE: R-Value is Measured 75F / Zero Wind

R-Value DOES NOT Measure:

- Longevity
- Stability
- Thermal Mass
- Resist Thermal Bridging
- Ability to Air Seal
- Advanced Framing Techniques

2021 IECC CHAPTER 4

R401.2.1 Prescriptive Compliance Options (R-Value U-Value)

R401.2.2 Total Building Performance Option (Rescheck)

R401.2.3 Energy rating Index Option (HERS)

https://codes.iccsafe.org/content/IECC2021P2/chapter-4-re-residential-energy-efficiency

U Value Prescriptive Method

TABLE R402.1.2MAXIMUM ASSEMBLY *U*-FACTORS[a] AND FENESTRATION REQUIREMENTS

CLIMATE ZONE	FENESTRATION *U*-FACTOR[f]	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC[d, e]	CEILING *U*-FACTOR	WOOD FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
0	0.50	0.75	0.25	0.035	0.084	0.197	0.064	0.360	0.477
1	0.50	0.75	0.25	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.25	0.026	0.084	0.165	0.064	0.360	0.477
3	0.30	0.55	0.25	0.026	0.060	0.098	0.047	0.091[c]	0.136
4 except Marine	0.30	0.55	0.40	0.024	0.045	0.098	0.047	0.059	0.065
5 and Marine 4	0.30	0.55	0.40	0.024	0.045	0.082	0.033	0.050	0.055
6	0.30	0.55	NR	0.024	0.045	0.060	0.033	0.050	0.055
7 and 8	0.30	0.55	NR	0.024	0.045	0.057	0.028	0.050	0.055

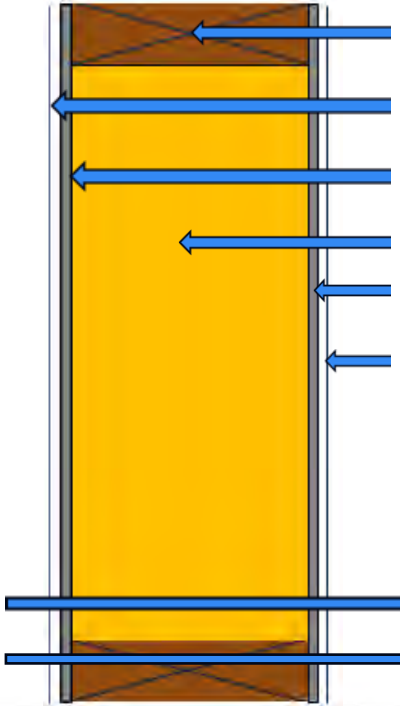
R-Value and U-Value

- R-Value Measures Heat that Does Not Pass Through
  (Typically –a single product ie Insulation)
- U-Value Measures the Heat that does Transfer through
  (Typically items with multiple parts ie door or window)
- U-Value is the Inverse Opposite of R Value

$$U = \frac{1}{R}$$

- Want “High R-Value” and “Low U-Value”

EXAMPLE U-VALUE of 2x4 16” OC Wall



COMPONENTS

2x4 Stud
Exterior Air Film
Exterior Plywood
Open Cell Foam
Interior Drywall
Interior Air Film

PATHWAYS FOR HEAT

Through the Insulation (91%)
Through the Wood Studs (9%

CALCULATE U-VALUE of 2x4 16’ OC Wall

Components	R-Value Path Through Wood	R-Value Path Through Insuation
Interior Air Film	*0.68*	0.68
Drywall	*0.55*	0.55
2x4 Stud	*3.29*	0
Insulation	*0*	13
Plywood	*0.78*	0.78
Exterior Air Film	*0.17*	0.17
TOTAL	*5.47*	15.18

$$\text{U Value Wall} = (Uwp \times WP\%) + (Uip \times IP\%)$$

$$\text{U Value Wall} = \left(\frac{1}{5.47} \times .09\right) + \left(\frac{1}{15.18} \times .91\right)$$

$$\text{U Value Wall} = (0.016) + (0.059)$$

$$\text{U value Wall} = 0.075$$

Where OC in 2x4 16 OC Works?

TABLE R402.1.2MAXIMUM ASSEMBLY *U*-FACTORS[a] AND FENESTRATION REQUIREMENTS

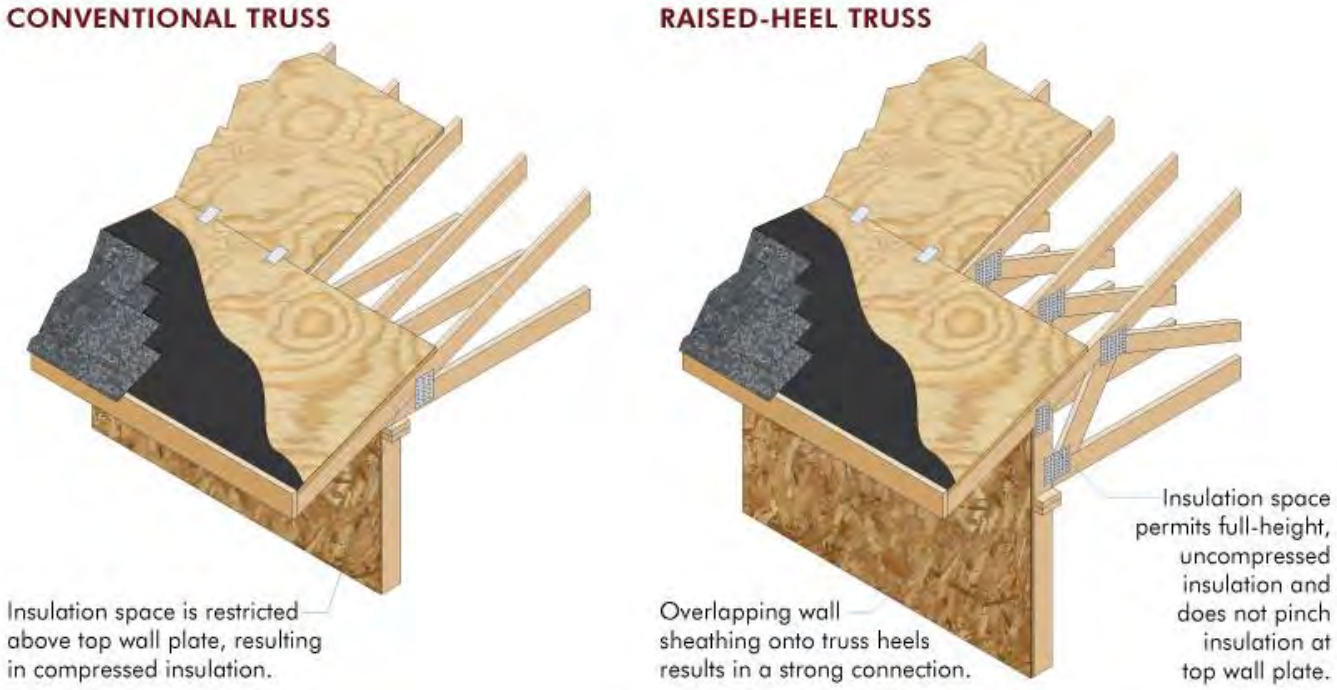
CLIMATE ZONE	FENESTRATION *U*-FACTOR[f]	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC[d, e]	CEILING *U*-FACTOR	WOOD FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
0	0.50	0.75	0.25	0.035	0.084	0.197	0.064	0.360	0.477
1	0.50	0.75	0.25	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.25	0.026	0.084	0.165	0.064	0.360	0.477
3	0.30	0.55	0.25	0.026	0.060	0.098	0.047	0.091[c]	0.136
4 except Marine	0.30	0.55	0.40	0.024	0.045	0.098	0.047	0.059	0.065
5 and Marine 4	0.30	0.55	0.40	0.024	0.045	0.082	0.033	0.050	0.055
6	0.30	0.55	NR	0.024	0.045	0.060	0.033	0.050	0.055
7 and 8	0.30	0.55	NR	0.024	0.045	0.057	0.028	0.050	0.055

R-Value PRESCRIPTIVE METHOD

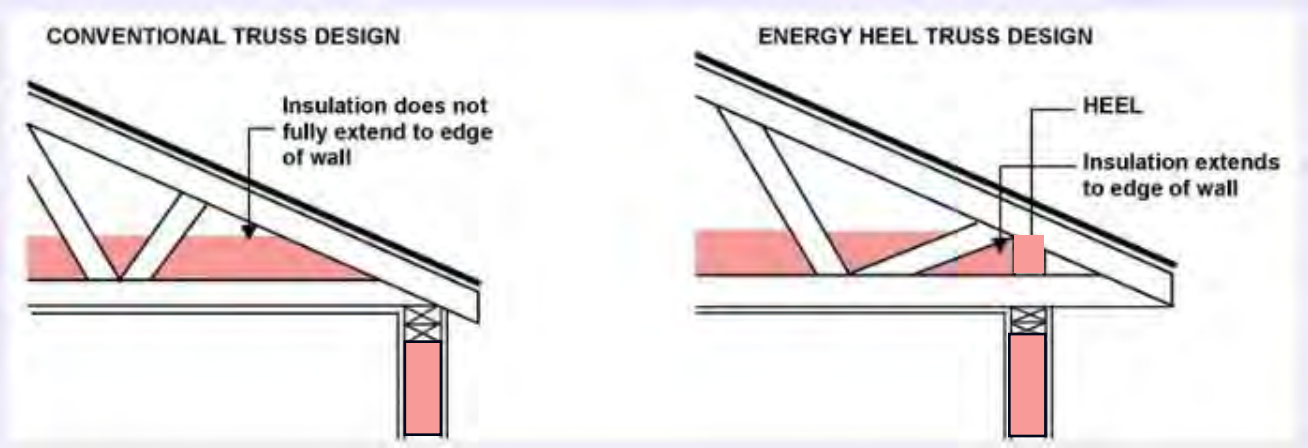
Insulation	Wall R-Value					
Climate Zone	2006	2009	2012 & 2015	2018	2021	2021 Option
1	13	13	13	13	13	0+10
2	13	13	13	13	13	0+10
3	13	13	20 / 13+5	20 / 13+5	20 / 13+5	0+15
4	13	13	20 / 13+5	20 / 13+5	20+5 / 13+10	0+15
5 & M4	19 / 13+5	20 / 13+5	20 / 13+5	20 / 13+5	20+5 / 13+10	0+15
6	19 / 13+5	20 / 13+5	20+5 / 13+10	20+5 / 13+10	20+5 / 13+10	0+20
7-8	21	21	20+5 / 13+10	20+5 / 13+10	20+5 / 13+10	0+20

Insulation	Ceiling R-Value (Flat Roofs / Encapsulated)				
Climate Zone	2006	2009	2012 & 2015	2018	2021
1	30	30	30	30	30
2	30	30	38	38	49
3	30	30	38	38	49
4	38	38	49	49	60
5 & M4	38	38	49	49	60
6	49	49	49	49	60
7-8	49	49	49	49	60

Raised Energy Heel



Energy Heels Save ENERGY AND $$$



R402.2.1 Ceilings with attics. INSIGHTS

Where Section R402.1.3 requires R-49 insulation in the ceiling or attic, installing R-38 over 100 percent of the ceiling or attic area requiring insulation shall satisfy the requirement for R-49 insulation wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. Where Section R402.1.3 requires R-60 insulation in the ceiling or attic, installing R-49 over 100 percent of the ceiling or attic area requiring insulation shall satisfy the requirement for R-60 insulation wherever the full height of uncompressed R-49 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the insulation and fenestration criteria in Section R402.1.2 and the Total UA alternative in Section R402.1.5.

500 SQFT or 20% Rule

R402.2.2 Ceilings without attics. INSIGHTS

Where Section R402.1.3 requires insulation *R*-values greater than R-30 in the interstitial space above a ceiling and below the structural roof deck, and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation *R*-value for such roof/ceiling assemblies shall be R-30. Insulation shall extend over the top of the wall plate to the outer edge of such plate and shall not be compressed. This reduction of insulation from the requirements of Section R402.1.3 shall be limited to 500 square feet (46 m^2) or 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the Total UA alternative in Section R402.1.5.

PERFORMANCE PATH IS IN THE CODE

SECTION R405
SIMULATED PERFORMANCE ALTERNATIVE (PERFORMANCE)

R405.3 Performance-based compliance.

Compliance based on simulated energy performance requires that a proposed residence (*proposed design*) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the *standard reference design*. Energy prices shall be taken from a source *approved* by the *code official*, such as the Department of Energy, Energy Information Administration's *State Energy Price and Expenditure Report*. *Code officials* shall be permitted to require time-of-use pricing in energy cost calculations.

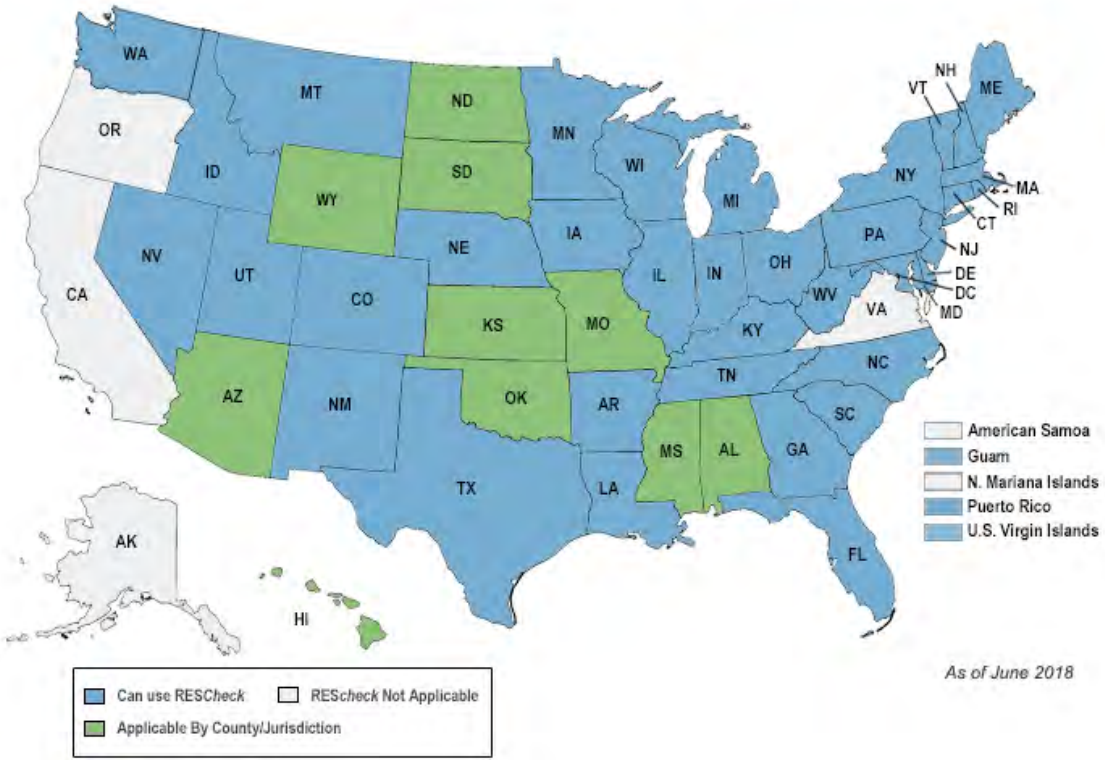
R405.4.2 Compliance report. INSIGHTS

Compliance software tools shall generate a report that documents that the *proposed design* complies with Section R405.3. A compliance report on the *proposed design* shall be submitted with the application for the building permit. Upon completion of the building, a compliance report based on the as-built condition of the building shall be submitted to the *code official* before a certificate of occupancy is issued. Batch sampling of buildings to determine energy code compliance for all buildings in the batch shall be prohibited.

PERFORMACE METHOD SOFTWARE

Free Download https://www.energycodes.gov/rescheck

States That Can Use REScheck to Show Compliance

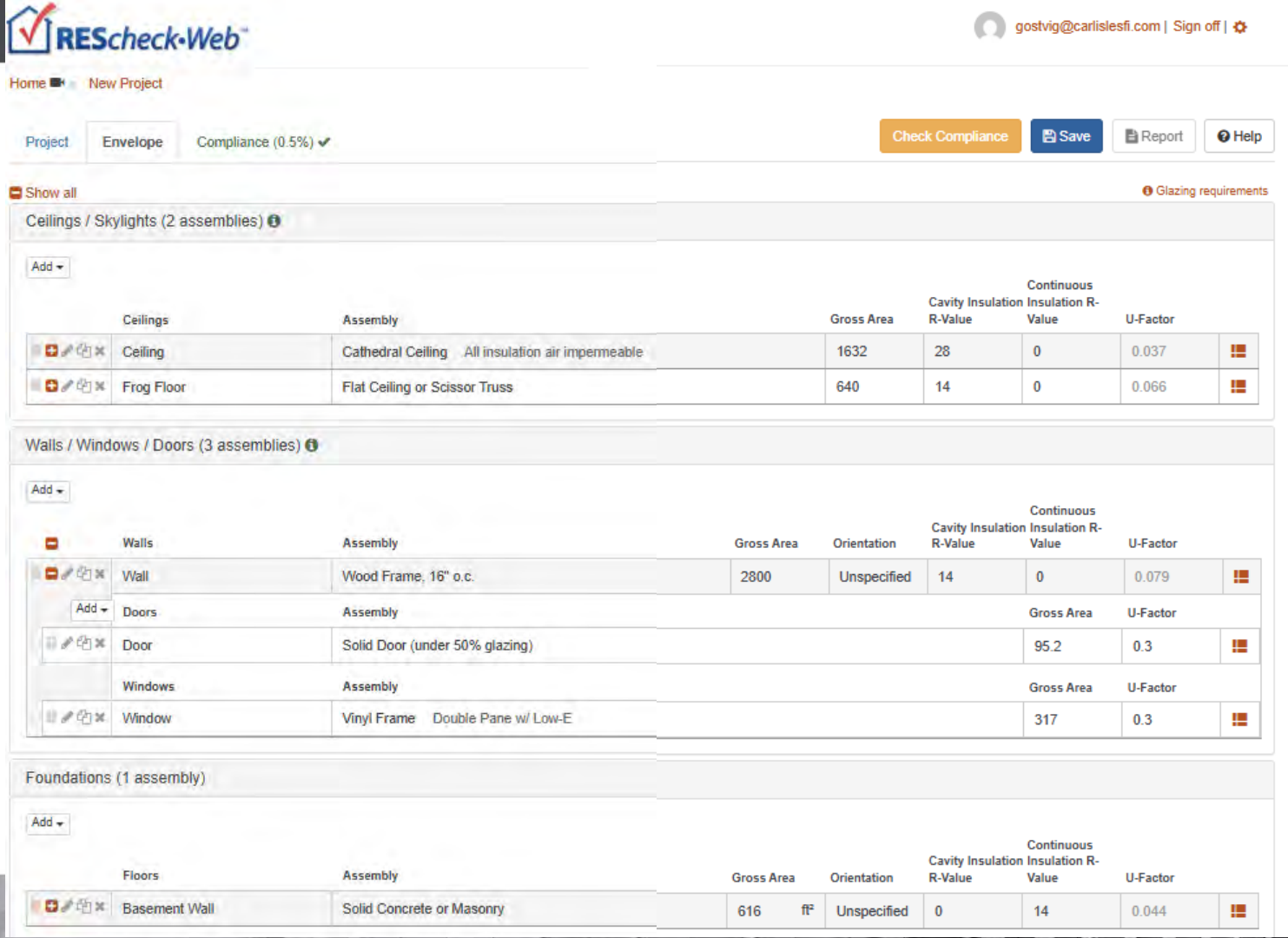


As of June 2018

Res-check on Lake Cabin

TAKE OFF	SQFT
Roof Deck	1935
Frog Floor	640
Walls Ext 2x4	2800
Basement Walls	616
Windows	317
Doors	95

Closed Cell
R-7/inch



Generated by REScheck-Web Software

Compliance Certificate

Project Ostvig Home

Energy Code:	**2009 IECC**
Location:	**Mineral, Virginia**
Construction Type:	**Single-family**
Project Type:	**New Construction**
Project SubType:	**None**
Orientation:	**Bldg. faces 0 deg. from North**
Conditioned Floor Area:	**1,940 ft2**
Glazing Area	**11%**
Climate Zone:	**4 (4321 HDD)**
Permit Date:	
Permit Number:	
All Electric	**false**
Is Renewable	**false**
Has Charger	**false**
Has Battery:	**false**
Has Heat Pump:	**false**

Construction Site:
485 Lake Forest Drive
Mineral, Virginia 23117

Owner/Agent:

Designer/Contractor:

Compliance: Passes using UA trade-off

Compliance: **0.5% Better Than Code** Maximum UA: **444** Your UA: **442**

The % Better or Worse Than Code Index reflects how close to compliance the house is based on code trade-off rules.
It DOES NOT provide an estimate of energy use or cost relative to a minimum-code home.

Slab-on-grade tradeoffs are no longer considered in the UA or performance compliance path in REScheck. Each slab-on-grade assembly in the specified climate zone must meet the minimum energy code insulation R-value and depth requirements.

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Prop. U-Factor	Req. U-Factor	Prop. UA	Req. UA
Frog Floor: Flat Ceiling or Scissor Truss	640	14.0	0.0	0.066	0.030	42	19
Ceiling: Cathedral Ceiling	1,632	28.0	0.0	0.037	0.030	60	49
Wall: Wood Frame, 16" o.c. Orientation: Unspecified	2,800	14.0	0.0	0.079	0.082	189	196
Door: Solid Door (under 50% glazing) Orientation: Unspecified	95			0.300	0.350	29	33
Window: Vinyl Frame Orientation: Unspecified	317			0.300	0.350	95	111
Basement Wall: Solid Concrete or Masonry Orientation: Unspecified Wall height: 8.0' Depth below grade: 8.0' Insulation depth: 8.0'	616	0.0	14.0	0.044	0.059	27	36

2009 IECC Energy Efficiency Certificate

Insulation Rating	R-Value
Above-Grade Wall	14.00
Below-Grade Wall	14.00
Floor	0.00
Ceiling / Roof	28.00
Ductwork (unconditioned spaces):	_____

Glass & Door Rating	U-Factor	SHGC
Window	0.30	
Door	0.30	

Heating & Cooling Equipment	Efficiency
Heating System: _____	_____
Cooling System: _____	_____
Water Heater: _____	_____

Name: _____ **Date:** _____

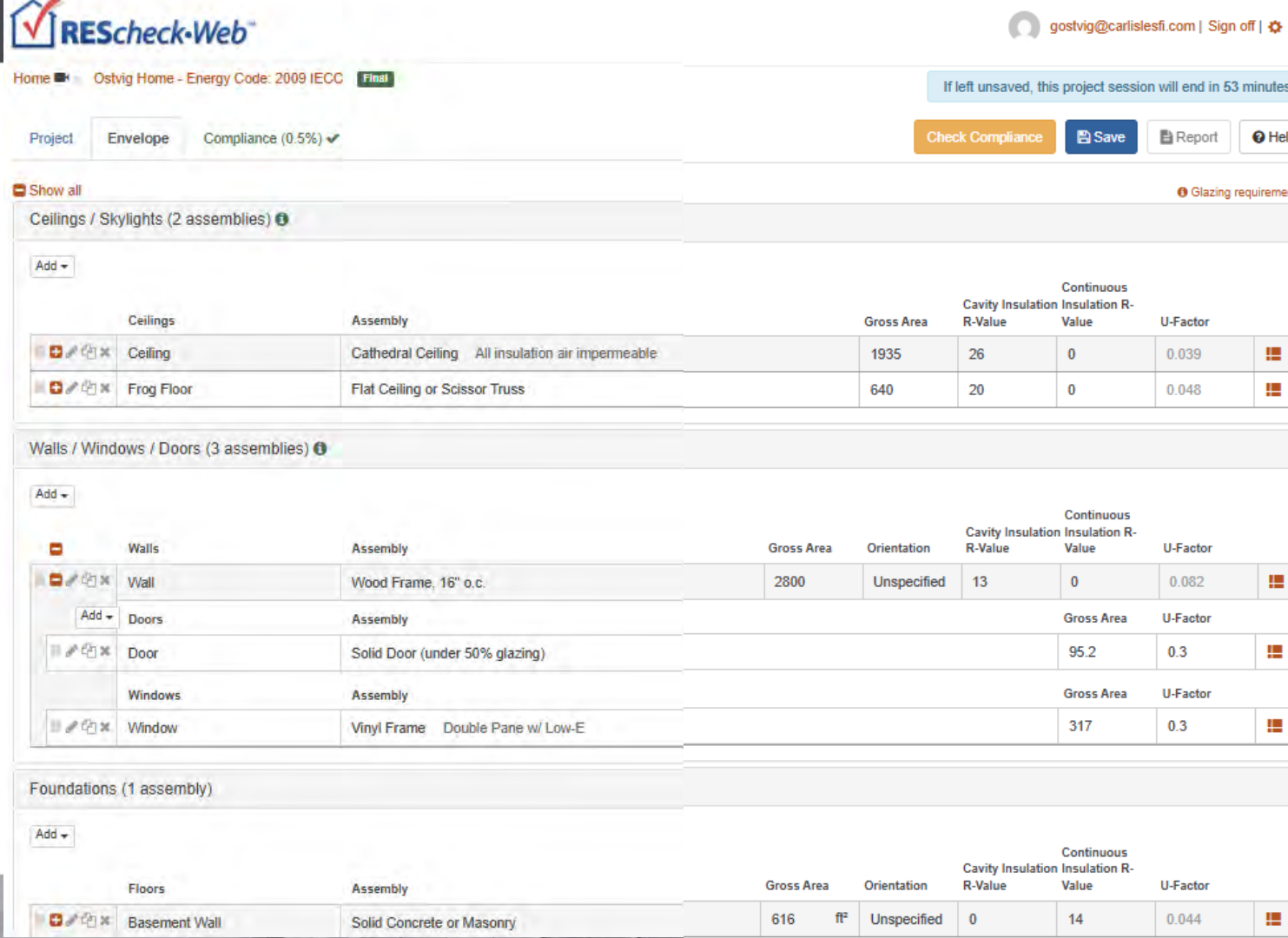
Comments

$3,498 Savings With Rescheck (CC)

PRESCRIPTIVE	SQFT	R-VALUE	DEPTH	BRDFT	COST/BRDFT	COST
Ceiling	1935	38	5.5	10642.5	$1.20	$12,771
Frog Floor	640	21	3	1920	$1.20	$2,304
Exterior 2x4 Walls	2800	13	2	5600	$1.20	$6,720
Basement Walls	616	10	1.5	924	$1.20	$1,109
					SALE PRICE	$22,904

U VALUE TRADE OFF	SQFT	R-VALUE	DEPTH	BRDFT	COST / BRDFT	COST
Ceiling	1935	28	4	7740	$1.20	$9,288
Frog Floor	640	14	2.5	1600	$1.20	$1,920
Exterior 2X4 Walls	2800	14	2	5600	$1.20	$6,720
Basement Walls	616	14	2	1232	$1.20	$1,478
					SALE PRICE	$19,406

Open Cell
R-3.7/ Inch



Generated by REScheck-Web Software

Compliance Certificate

Project Ostvig Home

Energy Code:	**2009 IECC**
Location:	**Mineral, Virginia**
Construction Type:	**Single-family**
Project Type:	**New Construction**
Project SubType:	**None**
Orientation:	**Bldg. faces 0 deg. from North**
Conditioned Floor Area:	**1,940 ft2**
Glazing Area	**11%**
Climate Zone:	**4 (4321 HDD)**
Permit Date:	
Permit Number:	
All Electric	**false**
Is Renewable	**false**
Has Charger	**false**
Has Battery:	**false**
Has Heat Pump:	**false**

Construction Site:
485 Lake Forest Drive
Mineral, Virginia 23117

Owner/Agent:

Designer/Contractor:

Compliance: Passes using UA trade-off

Compliance: **0.0% Better Than Code** Maximum UA: **453** Your UA: **453**

The % Better or Worse Than Code Index reflects how close to compliance the house is based on code trade-off rules. It DOES NOT provide an estimate of energy use or cost relative to a minimum-code home.

Slab-on-grade tradeoffs are no longer considered in the UA or performance compliance path in REScheck. Each slab-on-grade assembly in the specified climate zone must meet the minimum energy code insulation R-value and depth requirements.

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Prop. U-Factor	Req. U-Factor	Prop. UA	Req. UA
Frog Floor: Flat Ceiling or Scissor Truss	640	20.0	0.0	0.048	0.030	31	19
Ceiling: Cathedral Ceiling	1,935	26.0	0.0	0.039	0.030	75	58
Wall: Wood Frame, 16" o.c. Orientation: Unspecified	2,800	13.0	0.0	0.082	0.082	196	196
Door: Solid Door (under 50% glazing) Orientation: Unspecified	95			0.300	0.350	29	33
Window: Vinyl Frame Orientation: Unspecified	317			0.300	0.350	95	111
Basement Wall: Solid Concrete or Masonry Orientation: Unspecified Wall height: 8.0' Depth below grade: 8.0' Insulation depth: 8.0'	616	0.0	14.0	0.044	0.059	27	36

2009 IECC Energy Efficiency Certificate

Insulation Rating	R-Value
Above-Grade Wall	13.00
Below-Grade Wall	14.00
Floor	0.00
Ceiling / Roof	26.00
Ductwork (unconditioned spaces):	_____

Glass & Door Rating	U-Factor	SHGC
Window	0.30	
Door	0.30	

Heating & Cooling Equipment	Efficiency
Heating System:_____	_____
Cooling System:_____	_____
Water Heater:_____	_____

Name: _____ **Date:** _____

Comments

$2,001 Savings With Rescheck (OC)

PRESCRIPTIVE	SQFT	R-VALUE	DEPTH	BRDFT	COST / BRDFT	COST
CEILING	1935	38	10.5	20317.5	0.35	$7,111
FROG Floor	640	21	5.5	3520	0.35	$1,232
Exterior 2X4 Walls	2800	13	3.5	9800	0.35	$3,430
Basement Walls	616	10	1.5	924	1.2	$1,109
					TOTAL SALE	$12,882

U VALUE TRADE OFF	SQFT	R-VALUE	DEPTH	BRDFT	COST / BRDFT	COST
Ceiling	1935	26	7	13545	$0.35	$4,741
Frog Floor	640	20	5.5	3520	$0.35	$1,232
Exterior 2X4 Walls	2800	13	3.5	9800	$0.35	$3,430
Basement Walls	616	14	2	1232	$1.20	$1,478
					SALE PRICE	$10,881

ERI = Energy Rating Index Method

SECTION R406

ENERGY RATING INDEX COMPLIANCE ALTERNATIVE

R406.3 Energy Rating Index.

The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the *ERI reference design* has an Index value of 100 and a *residential building* that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1-percent change in the total energy use of the rated design relative to the total energy use of the *ERI reference design*. The ERI shall consider all energy used in the *residential building*.

ERI REPORT

Performed by Licensed REM RATE Professional (NOT DIY)

Cost $250-$500 per report

Incorporates Fenestrations and MEP

Provide to Inspector

E-Star

Home Energy Rating Certificate

1109 Ptarmigan
Woodland Park, CO 80863

5 Stars Plus
Confirmed Rating

Rating Number: 122908-111-026
Certified Energy Rater: Brandice N. Eslinger
Rating Date: 12/18/08
Rating Ordered For: Scott Homes, LTD.

Uniform Energy Rating System						Energy Efficient			
1 Star	1 Star Plus	2 Stars	2 Stars Plus	3 Stars	3 Stars Plus	4 Stars	4 Stars Plus	5 Stars	5 Stars Plus
500-401	400-301	300-251	250-201	200-151	150-101	100-91	90-86	85-71	70 or Less

HERS Index: 65

General Information

Conditioned Area:	3560 sq. ft.	House Type:	Single-family detached
Conditioned Volume:	40000 cubic ft.	Foundation:	Conditioned basement
Bedrooms:	3		

Mechanical Systems Features

Heating:	Fuel-fired air distribution, Natural gas, 93.5 AFUE.
Water Heating:	Conventional, Natural gas, 0.58 EF, 50.0 Gal.
Duct Leakage to Outside:	RESNET/HERS default
Ventilation System:	Balanced: ERV, 270 cfm, 180.0 watts.
Programmable Thermostat:	Heating: Yes Cooling: No

Building Shell Features

Ceiling Flat:	R-49	Exposed Floor:	NA
Vaulted Ceiling:	R-38	Window Type:	U:0.35, SHGC:0.31*
Above Grade Walls:	R-24, R-18	**Infiltration:**	
Foundation Walls:	R-13.0	Rate:	Htg: 1040 Clg: 1040 CFM50
Slab:	R-0.0 Edge, R-0.0 Under	Method:	Blower door test

Lights and Appliance Features

Percent Fluorescent Pin-Based:	10.00	Clothes Dryer Fuel:	Electric
Percent Fluorescent CFL:	20.00	Range/Oven Fuel:	Electric
Refrigerator (kWh/yr):	640.00	Ceiling Fan (cfm/Watt):	0.00
Dishwasher Energy Factor:	0.46		

Estimated Annual Energy Cost
Confirmed Rating

Use	MMBtu	Cost	Percent
Heating	102.6	$910	39%
Cooling	0	$0	0%
Hot Water	24.5	$210	9%
Lights/Appliances	43.0	$1146	49%
Photovoltaics	-0.0	$-0	-0%
Service Charges		$81	3%
Total		**$2348**	**100%**

This home meets or exceeds the minimum criteria for all of the following:
EPA Energy Star Home
2003 International Energy Conservation Code
2004 International Energy Conservation Code
2006 International Energy Conservation Code

E-Star Colorado
1626 Cole Blvd. Ste 375
Lakewood, CO 80401
303.216.2026
303.237.0992

The Home Energy Rating Standard Disclosure for this home is available from the rating provider.

REM/Rate - Residential Energy Analysis and Rating Software v12.6
This information does not constitute any warranty of energy cost or savings.

ERI Based on 2006 Structure with Score of 100

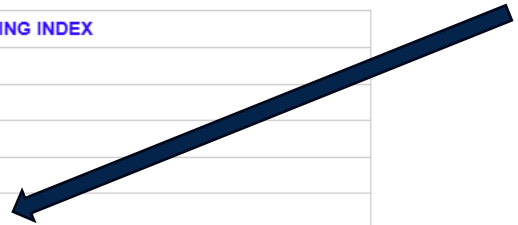
R406.3.1 ERI reference design.

The *ERI reference design* shall be configured such that it meets the minimum requirements of the 2006 *International Energy Conservation Code* prescriptive requirements.

The proposed *residential building* shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the *ERI reference design*.

TABLE R406.4MAXIMUM ENERGY RATING INDEX

CLIMATE ZONE	ENERGY RATING INDEX
1	52
2	52
3	51
4	54
5	55
6	54
7	53
8	53



An ERI Rating of 55 is 45% more efficient that exact same home built to 2006 standard

Resnet Approved Software for HER

REM RATE

ekotrope

RESNET HERS INDEX

EnergyGauge®
USA Residential | Commercial

AVAPEX
HOME ENERGY MANAGEMENT

FOAM in the UTAH CODE

R402.2.1.1 Unvented attic and unvented enclosed rafter assemblies.

Unvented attic and unvented enclosed rafter assemblies conforming to Section R806.5 shall be provided with an R-value of R-22 (maximum U-Factor of 0.045) in Climate Zone 3-B or an R-value of R-26 (maximum U-factor of 0.038) in Climate Zones 5-B and 6-B provided all the following conditions are met:

1. The unvented attic assembly complies with the requirements of the International Residential Code, Section R806.5.
2. The house shall attain a blower door test result < 2.5ACH 50.
3. The house shall require a whole house mechanical ventilation system that does not rely solely on a negative pressure strategy (must be positive, balanced or hybrid).
4. Where insulation is installed below the roof deck and the exposed portion of roof rafters are not already covered by the R-20 depth of the air-impermeable insulation, the exposed portion of the roof rafters shall be wrapped (covered) by minimum R-3 unless directly covered by drywall/finished ceiling. Roof rafters are not required to be covered by minimum R-3 if a continuous insulation is installed above the roof deck.
5. Indoor heating, cooling and ventilation equipment (including ductwork) shall be inside the building thermal envelope.

FOAM in the GEORGIA Code

Table R402.1.6
MINIMUM INSULATION R-VALUES FOR ENVELOPE COMPONENTS WHEN TRADE-OFFS ARE USED

Climate Zone	Wooda Framed Walls	Mass [a, b] Wall	Attic [a, c] Kneewall	Basement [a] Wall	Crawl [a] Wall	Floor Over Unheated Spaces	Ceilings with Attic Space	Vaulted [c, d] Unvented Attic Roofline Air-impermeable	Vaulted [c, d] Unvented Attic Roofline Air-permeable	Cathedralized [c, d] Vented Ceiling Roofline Air-permeable
2	13	4	18	0	0	13	30	20	20+5*	20
3	13	5	18	5	5	13	30	20	20+5*	20
4	13	5	18	5	5	13	30	20	20+15*	20
Window *U*-Factor 0.5 max with SHGC 0.30 max								* Air -impermeable as per IRC 806.5		

FOAM in the ALABAMA Code

305-2-4-.10 RESIDENTIAL ENERGY CODE. The 2015 International Energy Conservation Code (IECC) as modified below.

(b) **SECTION R402 BUILDING THERMAL ENVELOPE**

1. **R402.2.2.1 (N1102.2.2.1) Semi-conditioned attics.** Where table N1102.1.1 (R402.1.1) requires R-30 or Table N1102.1.3 (R402.1.3) requires a U-factor of 0.035, Sprayed Polyurethane Foam (SPF) with a U-factor of 0.05 or R-value of R-20 shall be deemed equivalent to the provisions in N1102.2.2 (R402.2.2).

FOAM in the NORTH CAROLINA CODE

R402.2.2.2 Unvented attic and unvented enclosed rafter assembly alternate.

Where Table R402.1.2 requires R-38 insulation in the ceiling, or Table R402.1.4 requires a ceiling U-factor of 0.030, installing air-impermeable insulation, as follows, to the underside or directly above the roof deck shall be deemed to satisfy the R-38 requirements: (i) R-20 (equivalent U-factor 0.05) for climate zone 3;(ii) R-25 (equivalent U-factor 0.037) for climate zone 4; and (iii) R-25 (equivalent U-factor 0.037) for climate zone 5. These air-impermeable insulation alternative R-value minimums apply in residences meeting the following criteria:

(1) The unvented attic or unvented enclosed rafter assemblies are constructed under Section R806.5 of the North Carolina Residential Code.

(2) The residence contains a mechanical ventilation system that operates on a positive, balanced, or hybrid pressure strategy in accordance with North Carolina Mechanical Code Section 403.3.

(3) For residences with air-impermeable insulation installed below the roof deck, exposed portions of the roof rafters are wrapped by a minimum of R-3 insulation unless directly covered by drywall or finished ceiling material. For residences with air-impermeable insulation installed above the roof deck, roof rafters do not require insulation wrapping if air-impermeable insulation installed above the roof deck is continuous.

(4) The residence obtains an ACH50 blower door test result of less than 3.0.

(5) The residence contains heating, cooling, and ventilation equipment and ductwork within thermal envelope.

FLORIDA

HB 1185 passed
Will be effective
July 1 2025

HOUSE OF REPRESENTATIVES STAFF ANALYSIS

BILL #: HB 1185 Thermal Efficiency Standards for Unvented Attic and Unvented Enclosed Rafter Assemblies
SPONSOR(S): Griffitts
TIED BILLS: **IDEN./SIM. BILLS:** SB 1130

REFERENCE	ACTION	ANALYST	STAFF DIRECTOR or BUDGET/POLICY CHIEF
1) Regulatory Reform & Economic Development Subcommittee	12 Y, 1 N	Wright	Anstead
2) Commerce Committee			

SUMMARY ANALYSIS

The Florida Building Code (Building Code), Energy Conservation (EC Code), regulates the design and construction of buildings for the effective use and conservation of energy over the useful life of each building. The EC Code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective.

The Building Code and EC code requires that unvented attics and unvented enclosed roof framing assemblies in residential homes must meet the following requirements:

- The unvented attic space is completely within the building thermal envelope.
- Where only air-impermeable insulation is provided, the insulation must be applied in direct contact with the underside of the structural roof sheathing.
- The attic is built using **R-30 insulation** in Climate Zone 1, and **R-38 insulation** in Climate Zone 2.
- The home is verified as having an air leakage rate not exceeding seven air changes per hour (**7 ACH50**) in Climate Zones 1 and 2.
- If the home has an air leakage rate less than three air changes per hour (**3 ACH50**), the home must have whole-house mechanical ventilation.

The bill provides that unvented attic and unvented enclosed rafter assemblies that are insulated and air sealed with a minimum of **R-20 air-impermeable insulation** meet the requirements of the EC Code, if all of the following apply:

- The building has a blower door test result of less than **3 ACH50**.

FOAM in the MINNESOTA CODE

TABLE R402.4.1.1AIR BARRIER AND INSULATION INSTALLATION

COMPONENT	CRITERIA[a]
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. Exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed. Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier sealed. Access openings, drop down stair or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers shall be insulated and the junction of the foundation and sill plate shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing shall be sealed.
Rim joists	Rim joists shall be insulated and include the air barrier.
Floors (including above-garage and cantilevered floors)	Insulation shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier shall be installed at any exposed edge of insulation.
Crawl space walls	Where provided in lieu of floor insulation, insulation shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.
Narrow cavities	Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.