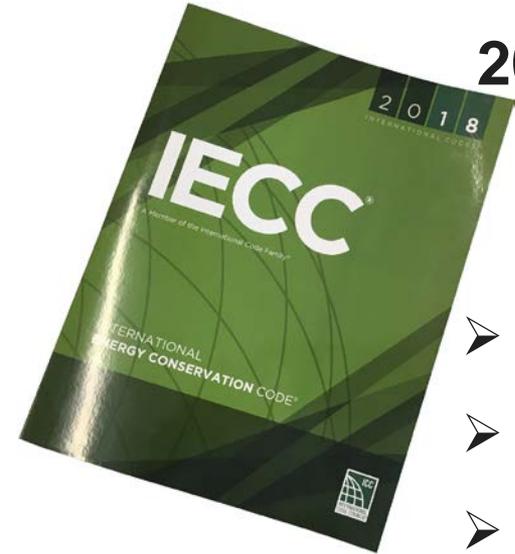


2018 International Energy Conservation Code

~ Changes to IECC local amendments ~

- **Commercial (C)**
- **Residential (R)**
- **International Residential Code IRC chapter 11 (N)**



C301.5 Local Mechanical Design Parameters *remain the same:*

- Winter Outdoor Dry-bulb (°F) =6°
- Summer Outdoor Dry-bulb (°F) =90°
- Winter Indoor Dry-bulb (°F) =72°
- Summer Indoor Dry-bulb (°F) =75°
- Winter Indoor Wet-bulb (°F) =62°
- Summer Indoor Wet-bulb (°F) =62°

IRC M1401.3.1 Equipment sizing. Heating & cooling equipment... thermal design parameters in Table R301.2(1) as amended.

- ***Climatic and Geographic Design Criteria*** table -

Table C402.1.5 Envelope requirements for electric heated buildings:

Above grade wall – metal bldg wall	R-13+R-7.5 ext ci	R-13+R-7.5 ext ci	0.06
Above grade wall – metal framed wall	R-13+R-10 ci	R-13+R-10 ci	0.052
Above grade wall – wood framed wall	R-15+R7.5 ci or R-19+R-5 ci ^c	R-15+R7.5 ci or R-19+R-5 ci ^c	0.048

^c Class 1 vapor retarders (poly) shall not be installed on the interior of framed walls where exterior ci value is less than R-7.5.

Table R402.1.2 Insulation & Fenestration Requirements by Component:

Heating System Type	Fenestration U-Factor ^b	Skylight ^b U-Factor	Glazed Fenestration SHGC	Ceiling R-Value	Wood Frame Wall R-Value ^h	Mass Wall R-Value ⁱ	Floor R-Value ^g	BSMT ^d Wall R-Value	Slab ^d R-Value & Depth	Crawl ^c Space Wall R-Value
Non-Electric heat	0.30	0.55	NR	49	20 or 13+5 ^{hl}	13/17	30	10/13 ⁱ 15/19 ^k	10,2 ft	10/13 ⁱ 15/19 ^k
Electric Heat	0.30	0.55	NR	49	20+5 ^{hl}	15/19	30	15/19	10,3 ft	15/19

^l Class 1 vapor retarders (poly) shall not be installed on the interior of framed walls where exterior ci value is less than R-7.5.

IRC Table 1102.1.2 footnote 'l' for BASEMENT WALL R-VALUE: R-15 batt is allowed for existing dwellings with uninsulated basements.

C402.2 / IRC N1102.2 Specific insulation requirements:

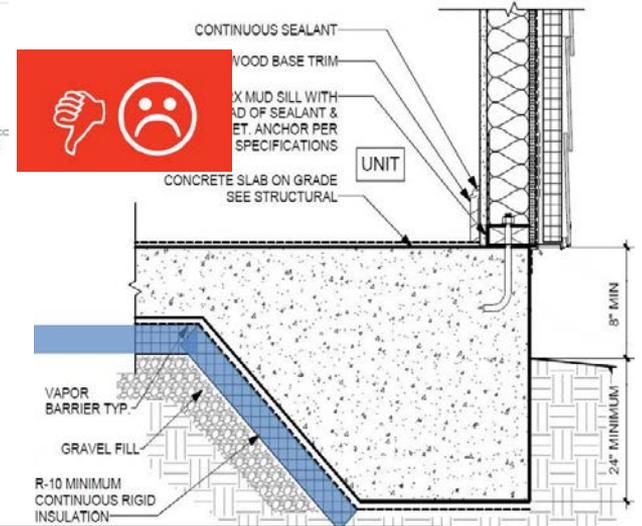
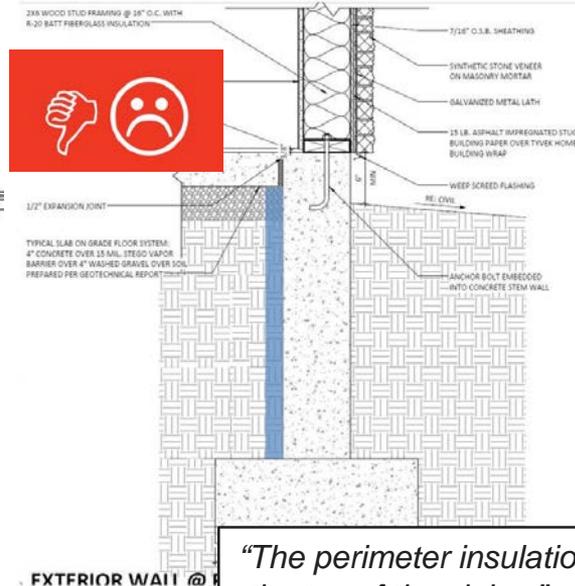
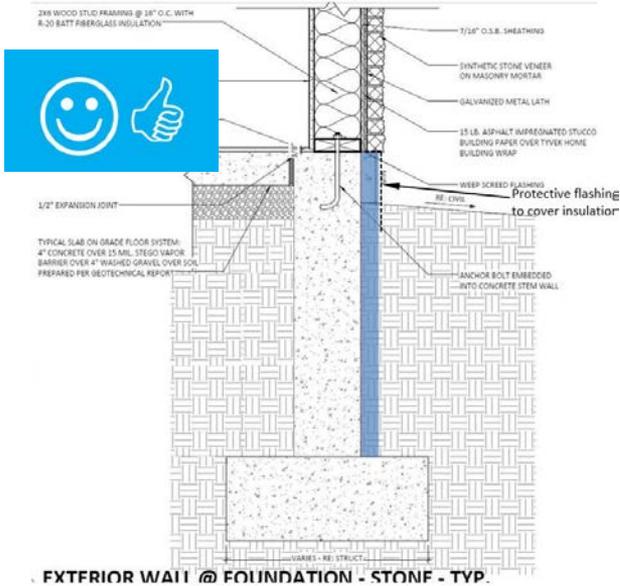
All insulation shall be installed to meet Residential Energy Services Network (RESNET) **Grade 1** standard. *Additionally but indirectly; IECC R303.2 Installation.



RESNET protocol for the effect of missing insulation on installation grade

Diagrams from the HERS Standards

C402.2.4 / R402.2.10 / IRC N1102.2.10 Slabs-on-grade perimeter insulation (Mandatory):



"The perimeter insulation shall extend downward from the top of the slab..."

R402.4.1.2 / N1102.4.1.2 Testing (Air Tightness Testing): ...in accordance with Section 802 of the RESNET Mortgage Industry National Home Energy Rating Standards and **RESNET / ICC 380, ASTM E779 or ASTM E1827...**



What this means: multipoint air leakage tests can now be reported at a minimum of 5 pressure differences instead of the previous minimum of 7 pressure differences.

image courtesy of The Energy Conservatory

R403.3.7 / N1103.3.7 Ducts located in conditioned space. For ducts to be considered as inside conditioned space, **the duct system shall be located completely within the continuous air barrier and within the building thermal envelope.**

Note: *Compliance alternative 2 was amended out.*



R405 Simulated Performance Alternative

- **R405.1 / IRC N1105.1 Scope** ...In addition, requirements for the Simulated Performance Alternative (SPA) are detailed within The City of Fort Collins Residential New Construction SPA Guide.

The guide states: Per 2018 IECC code section R405.4.2.2 the compliance report submitted for obtaining the certificate of occupancy shall include code report items 1-6 *and include the Home Energy Rating Certificate with corresponding **HERS** score.*

~ Significant Changes in the 2018 IECC ~

Commercial

Table C402.1.3 Envelope Insulation Minimum Requirements

Heated Slabs

- *2015 IECC*
- **2018 IECC**

CLIMATE ZONE	5 AND MARINE 4	
	All other	Group R
Heated slabs	R-15 for 36" below	R-15 for 36" below
Heated slabs ^h	R-15 for 36" below + R-5 full slab	R-15 for 36" below + R-5 full slab

Table C402.1.4 Opaque Thermal Envelope

Opaque doors

CLIMATE ZONE	5 AND MARINE 4	
	All other	Group R
Garage door <14% glazing	U-0.31	U-0.31



17	Door 2	Insulated Metal			Swinging	49 ft ²			0.6
18	Door 3	Insulated Metal			Non-Swinging	960 ft ²			0.34
19	Ext. Wall 5	Wood-Framed, 16in. o.c.	West	1 - Vehicular Mainten	Swinging Non-Swinging Garage door <14% glazing	440 ft ²	21	5	0.045

CHECK COMPLIANCE « To display compliance results, click the **Check Compliance** button.

C402.2.5 Below-grade walls. ...The *C*-Factor or *R*-Value required shall extend to a depth of not less than 10 feet below the outside finished ground level, or to the level of the lowest floor of the conditioned space enclosed by the below-grade wall, whichever is less.

C402.2.7 Airspaces. When the thermal properties of airspaces are calculated as part of the thermal wall assembly, these airspaces must be enclosed in an unvented cavity designed to minimize airflow into and out of the cavity.

Note: R-Value determination factor(s) found in ASHRAE Handbook of Fundamentals

C405.2.1 Occupant sensor controls. This was expanded to included lighting controls for offices, including open plan office areas.

New Project

PROJECT ENVELOPE

Code/Location

Code: 2018 IECC

State: Colorado

City: Fort Collins

If your location is not included here, choose a nearby location with similar weather conditions.

Project Type

New Construction Addition Alterations

Compliance Options

Efficiency: Unspecified

Air Barrier: High Performance HVAC
Reduced Lighting Power
On-site Renewable Energy
High Performance SWH
Enhanced Interior Lighting Controls
Dedicated Outdoor Air System
Enhanced Envelope Performance
Reduced Air Infiltration

Project Detail

This information compliance reports

Notes:

Envelope TBD

Interior Lighting TBD

Section C406 Additional Efficiency Packages

C406.9 Reduced Air Infiltration. Air infiltration shall be verified by whole-building pressurization testing... The measured air-leakage rate of the building envelope shall not exceed 0.25 cfm/ft²...

* Now a compliance option within code and **COMcheck** (if on the most current version).

C407.3 Performance-based compliance. ...The reduction in energy cost of the proposed design associated with *on-site renewable* energy shall be not more than 5% of the total energy cost.

Residential

Table R402.1.2 (R402.1.4) / IRC N1102.1.2 (N1102.1.4) Improved window efficiency

CLIMATE ZONE	FENESTRATION U-FACTOR ^b
5 and Marine 4	0.32 0.30

Table R402.1.2 / IRC N1102.1.2 Heated slab insulation

Footnote d: R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs, as indicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.

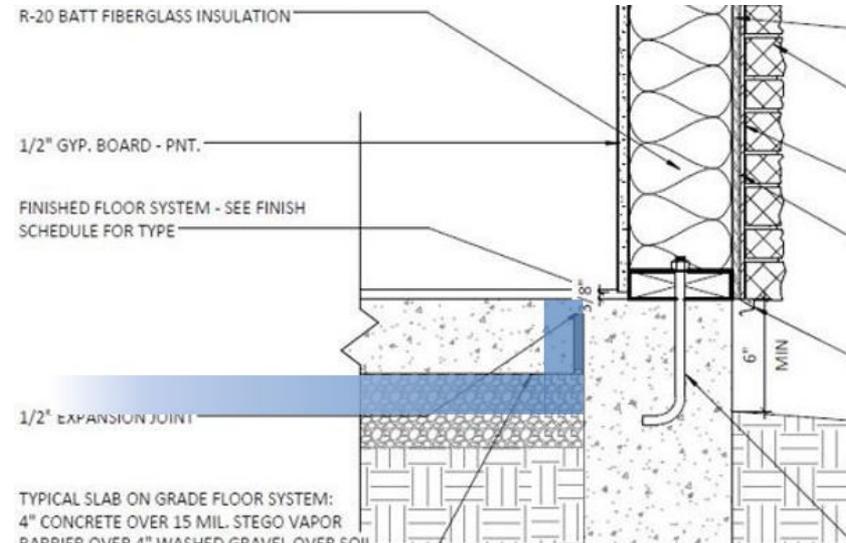


Table R403.6.1 / IRC N1103.6.1 Whole House Mechanical Ventilation

System Fan Efficacy. *Note: Most already meet this (language not specific to supply air temp)*

- A minimum fan efficiency of 1.2 cfm/watt is required for HRV and ERV's

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
HRV or ERV	Any	1.2 cfm/watt	Any

R404.1 / IRC N1104.1 Lighting equipment (Mandatory). Not less than 90% of the permanently installed lighting fixtures shall contain only high-efficacy lamps.

R406.4 / IRC N1106.4 Minimum Energy Rating Index (ERI)*

Climate Zone	Energy Rating Index ^a
5	55 61

- a. Where on-site renewable energy is included for compliance... building thermal envelope shall be \geq to Table R402.1.2 / N1102.1.2 of the 2015 IECC or IRC.

*2009 backstop in effect for buildings w/out renewable energy.

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