

2019 Residential Energy Conservation Requirements

The following is an overview of some of the requirements of the 2019 Residential Energy Conservation Code. There are other requirements, **not listed**, that may affect your project and can be found in the 2019 Energy Conservation Code.

3 Methods of Compliance

#1- Meet the requirements of SBC-8-2019 Energy Conservation Code (Prescriptive)
(see Page 2 and mandatory requirements below)

#2- Res-Check for Zone 5 & Mandatory requirements
(see <http://www.energycodes.gov/rescheck> and mandatory requirements below)

#3- Meeting the requirements of the Energy Conservation Code for Climate Zone 5 from Figure N 1101.7 or Table 1102.1.2

Prior to acceptance of your plans for review, your application must be accompanied by a detail illustrating compliance with the Energy Conservation Code or a Res-Check.

All 3 methods must also comply with the Mandatory Requirements Below!

Mandatory Requirements:

401.3 Energy Certificate – A permanent energy certificate shall be posted at an approved location (see pg. 12)

402.4 Air Leakage

- 1 – Visual inspection by the Building Department of all items in table 402.4.1.1 (see page 13)
- 2 – **Blower door testing by an approved third party.** Maximum air change rate per hour: 2019=8, 2020=7, 2021=6, 2022=5 (Report must be submitted to the Building Department prior to the issuance of a CO)

402.4.2 Fireplaces – New wood burning fireplaces shall have tight-fitting flue dampers or doors and outdoor combustion air

402.4.5 Recessed Lighting – All recessed lights must be IC rated, air tight and sealed to drywall/ceiling and have an air leakage rate of not more than 2.0 cfm. Exception: Fixtures completely in conditioned space

403.1.1 Programmable Thermostat – Programmable thermostat required for the primary heating /cooling system

403.3.3 Ducts (Sealing) Duct sealing and tightness must be verified by either:

- 1 – Post construction test (total leakage must be 8 cfm per 100 sq. ft. or less) or
- 2 – Rough in test (total leakage must be 6 cfm per 100 sq. ft. or less)

Exception: Testing not required if air handler and all ducts are located in conditioned space

403.3 Mechanical Piping – Piping capable of carrying fluids above 105* F or below 55* F shall be insulated to a minimum of R3

403.4 Hot Water Piping – All circulating service hot water piping shall be insulated to a minimum of R3 and shall include an automatic or readily accessible switch to turn off the pump when not in use

403.5 Mechanical Ventilation – Outdoor air intakes and exhausts shall have automatic or gravity dampers

403.6 Equipment Sizing – Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J.

Energy Conservation Code

**TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT (note a)**

Climate Zone	Fenestration U-Factor Note b	Skylight U-Factor Note b	Glazed Fenestration SHGC Note b	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value Note g	Floor R-Value	Basement Wall R-Value Note c	Slab R-Value & Depth Note d	Crawl Space Wall R-Value
5	0.35	0.60	NR	38	20 or 13 +5 Note f	13/17	30 Note e	10/13	10 2 ft	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums *U*-factors and SHGC are maximums. *R*-19 batts compressed into a nominal 2 × 6 framing cavity such that the *R*-value is reduced by *R*-1 or more shall be marked with the compressed batt *R*-value in addition to the full thickness *R*-value.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

c. “10/13” means *R*-10 continuous insulated sheathing on the interior or exterior of the home or *R*-13 cavity insulation at the interior of the basement wall.

d. *R*-5 shall be added to the required slab edge *R*-values for heated slabs.

e. Or insulation sufficient to fill the framing cavity, *R*-19 minimum.

f. “13+5” means *R*-13 cavity insulation plus *R*-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least *R*-2.

g. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.

Additional Requirements

402.2.4 Access hatches and doors. Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weather-stripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation.

402.2.8 Floors. Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking.

402.2.9 Basement walls. Walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Table 402.1.1 and Section 402.2.6

403.2.1 Duct insulation (Prescriptive). Supply ducts in attics shall be insulated to a minimum of *R*-8 where 3 inches in diameter and greater and *R*-6 where less than 3 inches in diameter. All other ducts shall be insulated to a minimum of *R*-6 where 3 inches in diameter or greater and *R*-4.2 where less than 3 inches in diameter.

Exception: Ducts or portions thereof located completely inside the building thermal envelope.

404.1 Lighting equipment. Not less than 75 percent of the lamps in permanently installed lighting fixtures shall be high-efficiency lamps or not less than 75 percent of the permanently installed fixtures shall contain only high efficacy lamps.

401.3 Certificate. A permanent certificate shall be completed and posted on or in the electrical distribution panel by the builder or registered design professional. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall list the predominant R-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and/or floor) and ducts outside conditioned spaces; U-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any required duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list “gas-fired unvented room heater”, “electric furnace” or “baseboard electric heater,” as appropriate. An efficiency shall not be listed for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

Energy Certificate

Street Address: _____

Town: _____

Predominant Values:

R Value Ceiling/Roof _____
 R Value Walls _____
 R Value Foundation _____
 R Value Ducts _____
 U Factor Fenestration _____
 SHGC Fenestration _____
 U Factor Skylights _____
 SHGC Skylights _____

Efficiency and Type of Heating Equipment _____

Efficiency and Type of Cooling Equipment _____

Efficiency and Type of Service Water Heater _____

Gas Fired Un-Vented Room Heater Installed Yes / No

Baseboard Electric Heater Installed Yes / No

Electric Furnace Installed Yes / No

Certificate completed by Builder/Registered Design Professional _____
Signature

All items in Table 402.4.1.1 below must be visually inspected by the Building Department during construction.

**TABLE 402.4.1.1
AIR BARRIER AND INSULATION COMPONENT CRITERIA**

COMPONENT	CRITERIA
General Requirements	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 with R-3 per inch minimum 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.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be air tight, IC rated, and sealed to drywall.
Plumbing and Wiring	Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/Tub on exterior wall	Exterior walls adjacent to showers and tubs shall be insulated and the air barrier installed separating them from the showers and tubs.
Electrical/Phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air sealed boxes shall be installed.
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.