

**CHAPTER 11**  
**INTERNATIONAL ENERGY CONSERVATION CODE**

**SECTION:**

- 7-11-1: International Energy Conservation Code Adopted  
7-11-2: Amendments to the International Energy Conservation Code

**7-11-1: INTERNATIONAL ENERGY CONSERVATION CODE ADOPTED:**

(A) International Energy Conservation Code Adopted: The International Energy Conservation Code, 2018 Edition, published by the International Code Council, Inc., is hereby adopted as an official Code of the City, except the portions deleted, modified or amended by the provisions of this Chapter.

(B) Code on File: One (1) copy of the International Energy Conservation Code, 2018 Edition, duly certified by the Clerk, shall be retained by the Clerk for use and examination by the public.

**7-11-2: AMENDMENTS TO INTERNATIONAL ENERGY CONSERVATION CODE:**

(A) Add the following as Section C101.5.2: C101.5.2 Industrial, electronic, and manufacturing equipment. Buildings or portions thereof that are heated or cooled exclusively to maintain the required operating temperature of industrial, electronic, or manufacturing equipment shall be exempt from the provisions of this code. Such buildings or portions thereof shall be separated from connected conditioned space by building thermal envelope assemblies complying with this code.

(B) Add the following as an exception under Section C402.5 Air leakage—thermal envelope (Mandatory): Exception: For buildings having over fifty thousand (50,000) square feet of conditioned floor area, air leakage testing shall be permitted to be conducted on less than the whole building, provided the following portions of the building are tested and their measured air leakage is area-weighted by the surface areas of the building envelope:

1. The entire floor area of all stories that have any spaces directly under a roof.
2. The entire floor area of all stories that have a building entrance or loading dock.
3. Representative above-grade wall sections of the building totaling at least twenty-five percent (25%) of the above-grade wall area enclosing the remaining conditioned space. Floor area tested under subparagraphs 1. or 2. of this exception shall not be included in the twenty-five percent (25%) of above-grade wall sections tested under this subparagraph.

(C) Add the following as exception number 7 under Section C403.5 Economizers (Prescriptive): 7. Unusual outdoor air contaminate conditions—Systems where special outside

air filtration and treatment for the reduction and treatment of unusual outdoor contaminants, makes an air economizer infeasible.

(D) Delete Table C404.5.1 and replace with the following:

<b>TABLE C404.5.1 PIPING VOLUME AND MAXIMUM PIPING LENGTHS</b>			
<b>NOMINAL PIPE SIZE (inches)</b>	<b>VOLUME (liquid ounces per foot length)</b>	<b>MAXIMUM PIPING LENGTH (feet)</b>	
		<b>Public lavatory faucets</b>	<b>Other fixtures and appliances</b>
1/4	0.33	31	50
5/16	0.5	N/A - non-standard size	50
3/8	0.75	17	50
1/2	1.5	10	43
<b>NOMINAL PIPE SIZE (inches)</b>	<b>VOLUME (liquid ounces per foot length)</b>	<b>MAXIMUM PIPING LENGTH (feet)</b>	
		<b>Public lavatory faucets</b>	<b>Other fixtures and appliances</b>
5/8	2	7	32
3/4	3	5	21
7/8	4	N/A - non-standard size	16
1	5	3	13
1 1/4	8	2	8
1 1/2	11	1	6
2 or larger	18	1	4

For SI: 1 inch = 25.4 mm; 1 foot = 304.8 mm; 1 liquid ounce = 0.030 L; 1 gallon = 128 ounces.

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(E) Delete the rows in Table R402.1.2 for climate zones “5 and Marine 4” and “6” and replace with the following:

TABLE R402.1.2 INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT <sup>a</sup>										
Climate Zone	Fenestration U- Factor <sup>b</sup>	Skylight U-factor <sup>b</sup>	Glazed Fenestration SHGC <sup>b, c</sup>	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value <sup>i</sup>	Floor R-Value	Basement Wall R-Value <sup>c</sup>	Slab <sup>d</sup> R-Value & Depth	Crawlspace <sup>c</sup> Wall R-Value
5	0.32	0.55	NR	38	20 or 13+5 <sup>h</sup>	13/17	30 <sup>g</sup>	15/19	10, 2 ft	15/19
6	0.30	0.55	NR	49	22 or 13+5 <sup>h</sup>	15/20	30 <sup>g</sup>	15/19	10, 4 ft	15/19

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(F) Add the following as footnote “k” to the title of Table R402.1.2—Insulation and Fenestration Requirements by Component: “k” for residential log home building thermal envelope construction requirements see Section 402.6.

(G) Delete the rows in Table R402.1.4 for climate zones “5 and Marine 4” and “6” and replace with the following:

TABLE R402.1.4 EQUIVALENT U-FACTORS <sup>a</sup>								
Climate Zone	Fenestration U-factor	Skylight U-factor	Ceiling U-factor	Frame Wall U-factor	Mass Wall U-factor <sup>b</sup>	Floor U-factor	Basement Wall U-factor	Crawlspace Wall U-factor
5	0.32	0.55	0.030	0.060	0.082	0.033	0.050	0.055
6	0.30	0.55	0.026	0.057	0.060	0.033	0.050	0.055

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(H) Delete Section R402.1 and replace with the following: R402.4.1 Building thermal envelope.

1. Until June 30, 2021, the building thermal envelope shall comply with Sections R402.1.1 (Installation) and either Section R402.1.2 (Testing) or Section R402.4.1.3 (Visual inspection).
2. Effective July 1, 2021, the building thermal envelope of a minimum of twenty percent (20%) of all new single-family homes constructed by each builder shall comply with Section R402.1.1 (Installation) and Section R402.4.1.2 (Testing). The authority having jurisdiction may:

- a. Determine how to enforce this requirement, starting with the fifth house and continuing with each subsequent fifth house.
  - b. Waive this requirement if significant testing indicates the five (5) air changes per hour (ACH) requirement is consistently being met or exceeded (resulting in a lower ACH).
  - c. Grant exceptions to this requirement in rural areas where testing equipment is not available or cost effective.
3. Effective July 1, 2021, the building thermal envelope of eighty percent (80%) of all new single-family homes constructed by each builder shall comply with Section R402.1.1 (Installation) and either Section R402.1.2 (Testing) or Section R402.4.1.3 (Visual inspection).
  4. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

(I) Delete Section 402.4.1.1 and replace with the following: R402.1.1 Installation. The components of the building thermal envelope as listed in Table R402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table R402.4.1.1, as applicable to the method of construction.

(J) Delete Section 402.1.2 and replace with the following: R402.4.1.2 Testing. Testing building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than five (5) Air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2-inch w.g. (50 Pascals). During Testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed.
2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft and flue dampers.
3. Interior doors shall be open.
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.
5. Heating and cooling system(s) shall be turned off.

6. HVAC ducts shall not be sealed.
7. Supply and return registers shall not be sealed.

(K) Add the following as Section R402.4.1.3: R402.4.1.3 Visual inspection. Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table R402.4.1.1, applicable to the method of construction, are field verified. Where required by code official an approved party independent from the installer of the insulation shall inspect the air barrier and insulation.

(L) Add the following as Section R402.6 Residential log home thermal envelope. Residential log home construction shall comply with Section R401 (general), Section R402 (Air leakage), Section R402.5 (Maximum fenestration U-factor and SHGC), Section R402.1 (Controls), the mandatory sections of Sections R403.3 through R403.9, Section R404 (Electrical Power and Lighting Systems), and either 1., 2., or 3. as follows:

1. Sections R402.2 through R402.3, Section R303.3.1 (Insulation), Section R404.1 (Lightning equipment), and Table R402.6 (Log Home Prescriptive Thermal Envelope Requirements by Component).
2. Section R405 (Simulated Performance Alternative).
3. REScheck (U.S. Department of Energy Building Codes Programs).

(M) Add the following as Table R402.6:

<b>TABLE R402.6 LOG HOME PRESCRIPTIVE THERMAL ENVELOPE REQUIREMENTS BY COMPONENT</b>									
For SI: 1 foot = 304.8 mm.									
Climate Zone	Fenestration U-factor <sup>a</sup>	Skylight U-factor	Glazed Fenestration SHGC	Ceiling R-value	Min. Average Log Size in Inches	Floor R-value	Basement Wall R-value <sup>d</sup>	Slab R-value & Depth <sup>b</sup>	Crawl Space Wall R-value <sup>d</sup>
5, 6 - High efficiency equipment path <sup>c</sup>	0.32	0.60	NR	49	5	30	15/19	10, 4 ft.	10/13
5	0.32	0.60	NR	49	8	30	10/13	10, 2 ft.	10/13
6	0.30	0.60	NR	49	8	30	15/19	10, 4 ft.	10/13

<sup>a</sup>The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

<sup>b</sup>R-5 shall be added to the required slab edge R-values for heated slabs.

<sup>c</sup>90% AFUE natural gas or propane, 84% AFUE oil, or 15 SEER heat pump heating equipment (zonal electric resistance heating equipment such as electric base board electric resistance heating equipment as the sole source for heating is considered compliant with the high efficiency equipment path).

<sup>d</sup>"15/19" means R-15 continuous insulated sheathing on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulated sheathing on the interior or exterior of the home. "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.

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(N) An exception to Section R403.3.5 shall be added as follows: Exception: Building-framing cavities used as ducts or plenums shall comply with Section M1601.1.1 (IRC).

(O) Delete Section R403.5.3 and replace with the following: R403.5.3 Hot water pipe insulation (Prescriptive). Insulation for hot water piping with a thermal resistance, R-value, of not less than R-3 shall be applied to the following:

1. Piping serving more than one (1) dwelling unit.
2. Piping located outside the conditioned space.
3. Piping located under a floor slab.
4. Buried piping.
5. Supply and return piping in recirculation systems other than demand recirculation systems.

(P) Delete Section R404.1 and replace with the following: R404.1 Lighting equipment (Mandatory). A minimum of seventy-five percent (75%) of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps or a minimum of seventy-five percent (75%) of the permanently installed lighting fixtures shall contain only high efficacy lamps.

(Q) Delete Section R406.3 and replace with the following: R406.3 Energy Rating Index. The Energy Rating Index (ERI) shall be determined in accordance with RESNET/ICC 301. Energy used to recharge or refuel a vehicle used for transportation on roads that are not on the building site shall not be included in the ERI reference design or the rated design.

(R) Delete Tabel R406.4 and replace with the following:

**Table R406.4 - Maximum Energy Rating Index**

<b>Climate Zone</b>	<b>Energy Rating Index<sup>a</sup></b>
5	68
6	68

<sup>a</sup> Where on-site renewable energy is included for compliance using the ERI analysis of Section R406.4, the building shall meet the mandatory requirements of Section R406.2, and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2015 International Energy Conservation Code. (3-20-20)T