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# CHAPTER 303
# STATE BUILDING CODE—REQUIREMENTS FOR ENERGY CONSERVATION IN CONSTRUCTION

[Prior to 12/21/05, see rules 661—16.800(103A) to 661—16.802(103A)]

**661—303.1(103A) Scope and applicability of energy conservation requirements.**

**303.1(1)** *Scope.* Rules 661—303.1(103A) through 661—303.3(103A) establish thermal energy efficiency standards for the design of new buildings and structures or portions thereof, additions to existing buildings, and renovation and remodeling of existing buildings, except for residential buildings of one or two dwelling units, which are intended for human occupancy and which are heated or cooled by regulating their exterior envelopes and selection of their heating, ventilation, and air-conditioning systems, service water heating systems and equipment for the efficient use of energy, and lighting efficiency standards for buildings intended for human occupancy which are lighted.

**303.1(2)** *Applicability.* Rules 661—303.1(103A) through 661—303.3(103A) apply to design and construction of buildings which are intended for human occupancy throughout the state of Iowa. Any construction of buildings or facilities which are intended for human occupancy and which are heated or cooled is covered, with the exception of renovation and remodeling of residential buildings of one or two dwelling units, which are not covered. Rule 661—303.2(103A) establishes standards for design and construction of residential buildings of three or fewer stories. Rule 661—303.3(103A) establishes standards for design and construction of commercial buildings and residential buildings of four or more stories. The occupancy of any building covered by this chapter shall be determined based upon the occupancy definitions in chapter 3 of the International Building Code, 2012 edition.

**303.1(3)** *Review by architect or engineer.*

*a.* *Review required.* The plans and specifications for all buildings to be constructed which exceed a total volume of 100,000 cubic feet of enclosed space that is heated or cooled shall be reviewed by a registered architect or licensed professional engineer for compliance with applicable energy efficiency standards.

*b.* *Statement of review.* A statement that a review has been accomplished and that the design is in compliance with the energy efficiency standards shall be signed and sealed by the responsible registered architect or licensed professional engineer. This statement shall be filed with the commissioner or a local building official on a form approved by the commissioner prior to construction or before obtaining any local permits. The statement shall be filed with the commissioner for any project which is subject to plan review by the building code bureau.

*c.* *Additional buildings.* If the plans and specifications relating to energy efficiency for a specific structure have been approved, additional buildings may be constructed from those same plans and specifications without need of further approval if construction begins within five years of the date of approval. Alterations of a structure which has been previously approved shall not require a review because of these changes, provided the basic structure remains unchanged and no additional energy is required for heating, cooling or lighting.

*d.* *Changes to approved plans.* Prior to the completion of construction, no changes shall be made to any approved plan or specifications which increase the amount of energy used for heating, cooling, or lighting, unless the changes are approved by the responsible registered architect or licensed professional engineer in writing and notice has been filed with the commissioner or a local building official. The commissioner or a local building official shall be notified of any change which is anticipated to decrease the amount of energy used. Notification pursuant to this paragraph shall be to the commissioner for any project which is subject to plan review by the building code bureau.

[**ARC 1301C**, IAB 2/5/14, effective 3/12/14]

**661—303.2(103A) Residential energy code.** The International Energy Conservation Code – Residential Provisions, 2012 edition, published by the International Code Council, 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041, is adopted by reference as the residential energy code of the state of Iowa building code, applicable to residential construction limited to three or fewer stories throughout the state of Iowa, with the following amendments:

Delete section R101.1.

Delete section R101.2 and insert in lieu thereof the following new section:

R101.2 Scope. This code applies to residential buildings and the building sites and associated systems and equipment as defined pursuant to 661—subrule 303.1(2). The remodeling or renovation of one- and two-family dwelling units is not within the scope of this code.

Delete section R103.3.1.

Delete section R103.3.2.

Delete section R103.3.3.

Delete section R104.1 and insert in lieu thereof the following new section:

R104.1 General. Construction or other work that is required to be inspected by state law or local ordinance shall be in accordance with sections R104.2 through R104.8. The state fire marshal shall have authority to perform audits to ensure compliance with the requirements of this code. When local governments conduct compliance audits, the information may be provided to the Department of Energy or to the state fire marshal in a timely way. Local governments may contract with the state fire marshal to conduct audits.

Delete sections R108 and R109 and all sections contained therein.

Delete section R402.1.1 and insert in lieu thereof the following new section:

R402.1.1 Insulation and fenestration criteria. The building thermal envelope shall meet the requirements of Table R402.1.1 based on the climate zone specified in chapter 3.

Table R402.1.1

Table R402.1.1 Insulation and Fenestration Requirements by Component[a]

| Climate Zone | Fenestration U-Factor[b] | Skylight U-Factor[b] | Glazed Fenestration SHGC[b,e] | Ceiling R-Value | Wood Frame Wall R-Value | Mass Wall R-Value[i] | Floor R-Value | Basement Wall R-Value[c] | Slab R-Value & Depth[d] | Crawl Space[c] Wall R-Value |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | NR | .75 | .25 | 30 | 13 | 3/4 | 13 | 0 | 0 | 0 |
| 2 | .40 | .65 | .25 | 38 | 13 | 4/6 | 13 | 0 | 0 | 0 |
| 3 | .35 | .55 | .25 | 38 | 20 or 13+5[h] | 8/13 | 19 | 5/13[f] | 0 | 5/13 |
| 4 | .35 | .55 | .40 | 49 | 20 or 13+5[h] | 8/13 | 19 | 10/13 | 10, 2ft | 10/13 |
| 5 | .32 | .55 | NR | 49 | 20 or 13+5[h] | 13/17 | 30[g] | 15/19 | 10, 2ft | 15/19 |
| 6 | .32 | .55 | NR | 49 | 20 or 13+5[h] | 15/20 | 30[g] | 15/19 | 10, 4ft | 15/19 |
| 7 & 8 | .32 | .55 | NR | 49 | 20+5 or 13+10[h] | 19/21 | 38[g] | 15/19 | 10, 4ft | 15/19 |

[a] R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.

[b] The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. EXCEPTION: Skylights may be excluded from glazed fenestration SHGC requirements in Climate Zones 1 through 3 where the SHGC for such skylights does not exceed .30.

[c] "15/19" means R-15 continuous insulation 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 insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation 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. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Climate Zones 1 through 3 for heated slabs.

[e] There are no SHGC requirements in the Marine Zone.

[f] Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1.

[g] Or insulation sufficient to fill the framing cavity, R-19 minimum.

[h] First value is cavity insulation; second value is continuous insulation or insulated siding. Therefore, "13+5" means R-13 cavity insulation plus R-5 continuous insulation or insulated siding. If structural sheathing covers 40 percent or less of the exterior, continuous insulation R-value shall be permitted to be reduced by no more than R-3 in the locations where structural sheathing is used – to maintain a consistent total sheathing thickness.

[i] The second R-value applies when more than half the insulation is on the interior of the mass wall.

Delete section R402.4.1.2 and insert in lieu thereof the following new section:

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour in Climate Zones 1 and 2, and 4 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 pascals). Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures;
3. Interior doors, if installed at the time of the test, shall be open;
4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling systems, if installed at the time of the test, shall be turned off; and
6. Supply and return registers, if installed at the time of the test, shall be fully open.

Delete section R403.2.2 and insert in lieu thereof the following new section:

R403.2.2 Sealing (mandatory). Ducts, air handlers, and filter boxes shall be sealed. Joints and seams shall comply with either the International Mechanical Code or International Residential Code, as applicable.

EXCEPTIONS:

1. Air-impermeable spray foam products shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

Duct tightness shall be verified by either of the following:

1. Postconstruction test: Leakage to outdoors shall be less than or equal to 4 cfm (113.3 L/min) per 100 square feet (9.29 $m^2$) of conditioned floor area or total leakage shall be less than or equal to 6 cfm (170 L/min) per 100 square feet (9.29 $m^2$) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (170 L/min) per 100 square feet (9.29 $m^2$) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure. All registers shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 3 cfm (85 L/min) per 100 square feet (9.29 $m^2$) of conditioned floor area.

Testing shall be conducted by an approved third party. A written report of the results shall be signed by the party conducting the test and provided to the code official.

EXCEPTION: The duct leakage test is not required for ducts and air handlers located entirely within the building thermal envelope unless cavities are used for returns.

Delete section R403.2.3 and insert in lieu thereof the following new section:

R403.2.3 Building cavities (mandatory). Building framing cavities shall not be used as supply ducts. Building framing cavities may be used as return ducts if both of the following conditions exist:

1. Ducts must be tested for duct leakage in accordance with section R403.2.2.
2. Exterior wall cavities shall not be used for return ducts.

[**ARC 8305B**, IAB 11/18/09, effective 1/1/10; **ARC 1301C**, IAB 2/5/14, effective 3/12/14]

**661—303.3(103A) Adoption of nonresidential energy code.** The International Energy Conservation Code – Commercial Provisions, 2012 edition, published by the International Code Council, 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041, is hereby adopted by reference as the nonresidential energy code of the state building code, applicable to commercial construction or residential construction of four or more stories within the state of Iowa, with the following amendments:

Delete section C101.1.

Delete section C101.2 and insert in lieu thereof the following new section:

C101.2 Scope. This code applies to commercial buildings and the buildings' sites and associated systems and equipment as defined pursuant to 661—subrule 303.1(2).

Delete section C103.3.1.

Delete section C104.1 and insert in lieu thereof the following new section:

C104.1 General. Construction or other work that is required to be inspected by state law or local ordinance shall be in accordance with sections C104.2 through C104.8.

Delete sections C108 and C109 and all sections contained therein.

[**ARC 8305B**, IAB 11/18/09, effective 1/1/10; **ARC 1301C**, IAB 2/5/14, effective 3/12/14]

**661—303.4(470) Life cycle cost analysis.**

**303.4(1)** *Submission required.* Any public agency as defined by Iowa Code section 470.1 shall prepare a life cycle cost analysis for any new construction having 20,000 square feet of usable floor space which is heated or cooled by a mechanical or electrical system or for any renovation where additions or alterations exceed 50 percent of the value of the facility and affect an energy system. The life cycle cost analysis shall be prepared in compliance with Iowa Code chapter 470 and shall be submitted to the state building code commissioner before construction commences.

**303.4(2)** *Notification by state agency.* Any public agency which is a state agency as defined in Iowa Code section 7D.34 shall, within 60 days of final selection of a design architect or engineer, notify the commissioner and the office of energy independence of the methodology to be used to perform the life cycle cost analysis. Notice shall be given on the forms provided by the office of energy independence for this purpose. A life cycle cost analysis prepared by a state agency shall be submitted in sufficient time ahead of the release of plans for bids to allow for revisions or additions which may be made to the plans. Public funds shall not be used for the construction or renovation of a facility unless the design for the work is prepared in accordance with Iowa Code chapter 470 and the actual construction or renovation is consistent with the design.

**303.4(3)** *Exemptions from implementation.* Any public agency responsible for construction or renovation of a public facility shall implement the recommendation of the life cycle cost analysis except as provided in this subrule.

*a.* A public agency responsible for construction or renovation of a public facility may apply to the commissioner for exemption from any recommendation of the life cycle cost analysis.

*b.* The public agency shall implement all recommendations of the life cycle cost analysis except those which have been approved for exemption by the commissioner and the director of the office of energy independence.

EXCEPTION: The public agency is not required to implement any recommendation which would result in a violation of any other provision of law. If the public agency determines that compliance with any recommendation of the life cycle cost analysis would result in a violation of law, the public agency shall so notify the commissioner.

*c.* The commissioner and the director of the office of energy independence shall evaluate each request for an exemption on a case-by-case basis.

*d.* The commissioner and the director of the office of energy independence shall consider the following factors in determining whether or not to grant an exemption:

(1) The purpose of the facility or renovation;

(2) Preservation of historic architectural features;

(3) Site considerations;

(4) Health and safety concerns;

(5) Compliance with any other provisions of law; and

(6) The technical feasibility of implementing the recommendation. "Technically feasible" means that a recommendation may be implemented without altering major structural features of an existing facility.

[**ARC 8305B**, IAB 11/18/09, effective 1/1/10]

**661—303.5(103A) Energy review fee.** The fee for filing an energy review shall be $25. Payment of the fee, by money order, check, or warrant made payable to Treasurer, State of Iowa, shall be included with the submission of documents for an energy review.

These rules are intended to implement Iowa Code chapter 103A.

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