

# Public Review Draft

Proposed Addendum p to Standard 189.1-2017

# Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

First Public Review (March 2019)  
(Draft Shows Proposed Changes to Current Standard)

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**Foreword:** This addendum identifies a number of requirements from Section 7 of Standard 189.1 as being appropriate for local jurisdictions to consider excluding from their adopting ordinances. A new Table 4.2 is added which lists these requirements in a format intended to simplify review by the jurisdiction. The new table is modeled on Table 302.1 of the 2015 IgCC and is not applicable to compliance with the standard, but is intended to be normative in the IgCC. Compliance with all requirements, including those listed in Table 4.2, remain required for compliance with Standard 189.1.

*Reasons for placing sections in the table:*

*Section 7.4.2.1 Building Envelope Requirements. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1.*

*Section 7.4.2.2 Single Rafter Roof Insulation. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1. Also, ASHRAE 90.1 provides requirements based on rafter depth.*

*Section 7.4.2.3 High Speed Doors. This is an exception to 90.1 allowing higher U-factors for high speed doors due to their speed in opening and closing.*

*Section 7.4.2.6 Permanent Projections. Studies show this section saves energy. However, it can add significant costs to the construction of the building.*

*Section 7.4.2.9 Orientation. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1 which has requirements on orientation.*

*Section 7.4.3.2 Ventilation Controls for Densely Occupied Spaces. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1.*

*Section 7.4.3.4 Economizers. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1.*

*Section 7.4.3.5 Zone Controls. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1.*

*Section 7.4.3.6 Fan System Power and Efficiency. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1.*

*Section 7.4.3.7 Exhaust Air Energy Recovery. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1.*

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*Section 7.4.3.8 Kitchen Exhaust Systems. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1.*

*Section 7.4.3.10 Automatic Control of HVAC and Lights in Hotel/Motel Guest Rooms. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1.*

*Section 7.4.4.2 Insulation for Spa Pools. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1.*

*Sections 7.4.6.2 Occupancy Sensor Controls with Multilevel Switching or Dimming and 7.4.6.3 Automatic Controls for Egress and Security Lighting. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements for lighting controls are beyond those in ASHRAE 90.1.*

*Sections 7.4.7.2 Supermarket Heat Recovery, 7.4.7.4 Programmable Thermostats, and 7.4.7.5 Refrigerated Display Cases. The user is required to use ASHRAE 90.1-2016, which saves more energy than the requirements that many jurisdictions now require. These requirements are beyond those in ASHRAE 90.1.*

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**Note:** *In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes. Only these changes are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed substantive changes.*

## **Addendum p to 189.1-2017**

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*Add a new informative Section 4.2 including a new informative Table 4.2, and move Sections 4.1.1 through 4.1.4 to a new Section 4.3:*

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### **4. ADMINISTRATION AND ENFORCEMENT**

**4.1 General.** *Building projects shall comply with Sections 4 through 11. Within each of those sections, building projects shall comply with all mandatory provisions (x.3) and, where offered, either the*

- a. *Prescriptive Option (x.4) or*
- b. *Performance Option (x.5).*

**Informative Note – to become normative in IgCC:**

**4.2 Requirements determined by the jurisdiction.** *The jurisdiction shall indicate the following information in Informative Table 4.2 for inclusion in its code adopting ordinance:*

1. Where “No” boxes are provided, the jurisdiction shall check the box to indicate where that section is not to be enforced as a requirement in the jurisdiction. Where the “No” box is not checked, that section is to be enforced.
2. Where a numerical value is required to specify the level of performance required, the jurisdiction shall indicate the required value. Where a numerical value is not indicated, the value in the text is to be enforced.

***Informative Note:*** *The jurisdictional requirements listed in Table 4.2 are formatted to afford jurisdictions the flexibility to adapt the code in a manner that is best suited to meet their unique environmental and regional goals and needs. Enforcement of these jurisdictional requirements will result in higher performing buildings, but may go beyond the needs of specific jurisdictions. Jurisdictional option provisions are indicated in the body of the standard with the symbol [JO] after the section number.*

**INFORMATIVE TABLE 4.2 – to become normative in IgCC  
REQUIREMENTS DETERMINED BY THE JURISDICTION**

<b><u>SECTION</u></b>	<b><u>SECTION TITLE OR DESCRIPTION AND DIRECTIVES</u></b>	<b><u>Jurisdictional Requirement</u></b>
<u>7.4.2.1</u>	<u>Building Envelope Requirements</u>	___ No
<u>7.4.2.2</u>	<u>Single Rafter Roof Insulation</u>	___ No
<u>7.4.2.3</u>	<u>High Speed Doors</u>	___ No
<u>7.4.2.6</u>	<u>Permanent Projections</u>	___ No
<u>7.4.2.9</u>	<u>Orientation</u>	___ No
<u>7.4.3.2</u>	<u>Ventilation Controls for Densely Occupied Spaces</u>	___ No
<u>7.4.3.4</u>	<u>Economizers</u>	___ No
<u>7.4.3.5</u>	<u>Zone Controls</u>	___ No
<u>7.4.3.6</u>	<u>Fan System Power and Efficiency</u>	___ No
<u>7.4.3.7</u>	<u>Exhaust Air Energy Recovery</u>	___ No
<u>7.4.3.8</u>	<u>Kitchen Exhaust Systems</u>	___ No
<u>7.4.3.10</u>	<u>Automatic Control of HVAC and Lights in Hotel/Motel Guest Rooms</u>	___ No
<u>7.4.4.2</u>	<u>Insulation for Spa Pools</u>	___ No
<u>7.4.6.2</u>	<u>Occupancy Sensor Controls with Multilevel Switching or Dimming.</u>	___ No
<u>7.4.6.3</u>	<u>Automatic Controls for Egress and Security Lighting</u>	___ No
<u>7.4.7.2</u>	<u>Supermarket Heat Recovery</u>	___ No
<u>7.4.7.4</u>	<u>Programmable Thermostats</u>	___ No
<u>7.4.7.5</u>	<u>Refrigerated Display Cases</u>	___ No

**4.3 References and Appendices.**

**4.13.1 Referenced Standards.** The standards referenced in this standard and listed in Section 11 shall be considered part of the requirements of this standard to the prescribed extent of such reference. Where differences exist between provisions of this standard and a referenced standard, the provisions of this standard shall apply. Informative references in Informative Appendix G are cited to acknowledge sources and are not part of this standard.

**4.13.2 Normative Appendices.** The normative appendices to this standard are considered to be integral parts of the mandatory requirements of this standard, which for reasons of convenience are placed apart from all other normative elements.

**4.13.3 Informative Appendices.** The informative appendices to this standard, and informative notes located within this standard, contain additional information and are not mandatory or part of this standard.

**4.13.4 Reference Standard Reproduction Annexes.** The reference standard reproduction annexes contain material that is cited in this standard but that is contained in another standard. The reference standard reproduction annexes are not part of this standard but are included in its publication to facilitate its use.

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*Add [JO] following the section number to indicate jurisdictional options in Sections listed in Table 4.2*

**7.4.2 Building Envelope.** The *building envelope* shall comply with ANSI/ASHRAE/IES Standard 90.1, Section 5, with the following modifications and additions.

**7.4.2.1 [JO] Building Envelope Requirements.** The *building envelope* shall comply with the requirements in ANSI/ASHRAE/IES Standard 90.1, Tables 5.5-0 through 5.5-8, with the following modifications to values in each table. For the opaque elements, each U-factor, C-factor, and F-factor in Tables 5.5-4 through 5.5-8 shall be reduced by 5%. The “Insulation Min. R-Value” column in ANSI/ASHRAE/IES Standard 90.1, Tables 5.5-4 through 5.5-8, shall not apply. For *vertical fenestration* and *skylights*, each U-factor shall be reduced by 5%. For *skylights* and east- and west-oriented *vertical fenestration*, each *solar heat gain coefficient (SHGC)* in Tables 5.5-0 through 5.5-8 shall be reduced by 5%.

**Exceptions to 7.4.2.1:**

...

**7.4.2.2 [JO] Single-Rafter Roof Insulation.** *Single-rafter roofs* shall comply with the requirements in Normative Appendix A, Table A-1. These requirements supersede the requirements in ANSI/ASHRAE/IES Standard 90.1, Section A2.4.2.4. ANSI/ASHRAE/IES Standard 90.1, Section A2.4.2.4 and Table A2.4.2, shall not apply.

**7.4.2.3 [JO] High-Speed Doors.** *High-speed doors* that are intended to operate on average at least 75 cycles per day shall not exceed a maximum U-factor of 1.20 Btu/h·ft<sup>2</sup>·°F (6.81 W/ m<sup>2</sup>·K). Opening rate, closing rate, and average cycles per day shall be included in construction drawings. ANSI/ASHRAE/IES Standard 90.1, Sections 5.5.3.6 and 5.5.4.3, shall not apply for *high-speed doors* complying with all criteria in this section.

**7.4.2.6. [JO] Permanent Projections.** For *Climate Zones* 0 through 3 and *Climate Zones* 4B and 4C, the *vertical fenestration* on the west, south, and east shall be shaded by permanent projections that have an area-weighted average *projection factor (PF)* of not less than 0.50 for the first story above grade and 0.25 for other above-grade stories. The building is allowed to be rotated up to 45 degrees to the nearest cardinal orientation for purposes of calculations and showing compliance. Where different windows or glass doors have different *PF* values, each shall be evaluated separately, or an area-weighted *PF* value shall be calculated and used for all windows and glass doors. Horizontal projections shall extend over the full width of the glazing.

**Exceptions to 7.4.2.6:**

...

**7.4.2.9 [JO] Orientation.** The *vertical fenestration* shall comply with either (a) or (b):

- a.  $A_W \leq (A_N + A_S)/4$  and  $A_E \leq (A_N + A_S)/4$
- b.  $A_W \times SHGC_W \leq (A_N \times SHGC_C + A_S \times SHGC_C)/6$  and  $A_E \times SHGC_E \leq (A_N \times SHGC_C + A_S \times SHGC_C)/6$

where

$SHGC_x$  = the *SHGC* for orientation  $x$  that complies with Section 7.4.2.7

$SHGC_C$  = the *SHGC* criteria for each *climate zone* from Section 7.4.2.1

$A_x$  = *fenestration area* for orientation  $x$

$N$  = north (oriented less than 45 degrees of true north)

$S$  = south (oriented less than 45 degrees of true south)

$E$  = east (oriented less than or equal to 45 degrees of true east)

$W$  = west (oriented less than or equal to 45 degrees of true west)

**Exceptions to 7.4.2.9:**

...

**7.4.3 Heating, Ventilating, and Air Conditioning.** The heating, ventilating, and air conditioning shall comply with ANSI/ASHRAE/IES Standard 90.1, Section 6, with the following modifications and additions.

**7.4.3.1 Minimum Equipment Efficiencies for the Alternate Renewables Approach.** All *building projects* complying with the Alternate Renewables Approach in Section 7.4.1.1.2 shall comply with the applicable equipment efficiency requirements in Normative Appendix B and the applicable ENERGY STAR requirements in Section 7.4.7.3.2. Where equipment efficiency is not defined/listed in Normative Appendix B or in Section 7.4.7.3.2, the equipment shall meet the minimum efficiency requirements defined/listed in ANSI/ASHRAE/IES Standard 90.1. Specifically, this applies to the following products in ANSI/ASHRAE/IES Standard 90.1:

...

**7.4.3.2 [JO] Ventilation Controls for Densely Occupied Spaces.** The requirements in this section supersede those in ANSI/ASHRAE/IES Standard 90.1, Section 6.4.3.8. *Demand control ventilation (DCV)* shall be provided for *densely occupied spaces* served by systems with one or more of the following:

- a. An air-side economizer
- b. *Automatic* modulating control of the outdoor air dampers
- c. A design outdoor airflow greater than 1000 cfm (500 L/s)

**Exceptions to 7.4.3.2:**

...

**7.4.3.4 [JO] Economizers.** Systems shall include economizers meeting the requirements in ANSI/ASHRAE/IES Standard 90.1, Section 6.5.1, except as modified by the following:

...

**7.4.3.5 [JO] Zone Controls.** The exceptions to ANSI/ASHRAE/IES Standard 90.1, Section 6.5.2.1, shall be modified as follows:

- a. Exception (1) shall not be used.

- b. Exception (2)(a)(2) shall be replaced by the following text: “the design outdoor airflow rate for the zone.”

**7.4.3.6 [JO] Fan System Power and Efficiency**

**7.4.3.6.1 Fan System Power Limitation.** Systems shall have fan power limitations 10% below limitations specified in ANSI/ASHRAE/IES Standard 90.1, Table 6.5.3.1-1. This requirement supersedes the requirement in ANSI ASHRAE/IES Standard 90.1, Section 6.5.3.1 and Table 6.5.3.1-1. All exceptions in ANSI/ASHRAE/IES Standard 90.1, Section 6.5.3.1, shall apply.

**7.4.3.6.2 Fan Efficiency.** The fan efficiency requirements defined in ANSI/ASHRAE/IES Standard 90.1, Section 6.5.3.1.3, shall be used, except that the total efficiency of the fan at the design point of operation shall be within ten percentage points of the maximum total efficiency of the fan. All exceptions in ANSI/ASHRAE/IES Standard 90.1, Section 6.5.3.1.3, shall apply.

**7.4.3.7 [JO] Exhaust Air Energy Recovery.** The exhaust air energy recovery requirements defined in ANSI/ASHRAE/IES Standard 90.1, Section 6.5.6.1, including the requirements in Tables 6.5.6.1-1 and 6.5.6.1-2, shall be used except that the energy recovery effectiveness shall not be less than 60%, superseding the 50% effectiveness requirement in ANSI/ASHRAE/IES Standard 90.1, Section 6.5.6.1.

**7.4.3.8 [JO] Kitchen Exhaust Systems.** The requirements in ANSI/ASHRAE/IES Standard 90.1, Section 6.5.7.2 shall apply, except as follows: Sections 7.4.3.8.1 and 7.4.3.8.2 supersede the requirements in ANSI/ASHRAE/IES Standard 90.1, Sections 6.5.7.2.2 and 6.5.7.2.3.

...

**7.4.3.10 [JO] Automatic Control of HVAC and Lights in Hotel/Motel Guest Rooms.** In hotels and motels with over 50 guest rooms, *automatic controls* for the lighting, switched outlets, television, and HVAC equipment serving each guest room shall be configured according to the following requirements.

...

**7.4.4 Service Water Heating.** The *service water heating* shall comply with ANSI/ASHRAE/IES Standard 90.1, Section 7, with the following modifications and additions.

**7.4.4.1 Equipment Efficiency for the Alternate Renewables Approach.** All *building projects* complying with the Alternate Renewables Approach in Section 7.4.1.1.2 shall comply with the applicable equipment efficiency requirements in Normative Appendix B, Table B-9, and with the applicable ENERGY STAR requirements in Section 7.4.7.3.2. These requirements supersede the requirements in ANSI/ASHRAE/IES Standard 90.1, Table 7.8.

**7.4.4.2 [JO] Insulation for Spa Pools.** Pools heated to more than 90°F (32°C) shall have side and bottom surfaces insulated on the exterior with a minimum insulation value of R-12 (R-2.1).

**7.4.5 Power.** The power shall comply with ANSI/ASHRAE/IES Standard 90.1, Section 8.

**7.4.6 Lighting.** The lighting shall comply with ANSI/ASHRAE/IES Standard 90.1, Section 9, with the following modifications and additions.

**7.4.6.2 [JO] Occupancy Sensor Controls with Multilevel Switching or Dimming.** The lighting in commercial and industrial storage stack areas shall be controlled by an occupant sensor with multilevel switching or dimming system that reduces lighting power a minimum of 50% within 20 minutes of all occupants leaving the stack area.

**Exception to 7.4.6.2:**

...

**7.4.6.3 [JO] Automatic Controls for Egress and Security Lighting.** Lighting in any area within a building that is required to be continuously illuminated for reasons of building security or emergency

egress shall not exceed  $0.1 \text{ W/ft}^2$  ( $1 \text{ W/m}^2$ ). Additional egress and security lighting shall be allowed, provided it is controlled by an *automatic* control device that turns off the additional lighting.

...

**7.4.7 Other Equipment.** The other equipment shall comply with ANSI/ASHRAE/IES Standard 90.1, Section 10, with the following modifications and additions.

**7.4.7.1 Equipment Efficiency for the Alternate Renewables Approach.** All *building projects* complying with the Alternate Renewables Approach in Section 7.4.1.1.2 shall comply with the applicable equipment efficiency requirements in Normative Appendix B and the applicable ENERGY STAR requirements in Section 7.4.7.3.2.

**7.4.7.2 [JO] Supermarket Heat Recovery.** Supermarkets with a floor area of  $25,000 \text{ ft}^2$  ( $2500 \text{ m}^2$ ) or greater shall recover waste heat from the condenser heat rejection on *permanently installed* refrigeration equipment meeting one of the following criteria:

...

**7.4.7.4 [JO] Programmable Thermostats.** Residential programmable thermostats shall meet the requirements of NEMA Standards Publication DC 3, Annex A, "Energy-Efficiency Requirements for Programmable Thermostats."

**7.4.7.5 [JO] Refrigerated Display Cases.** All open refrigerated display cases shall be covered by using field-installed strips, curtains, or doors.