

# Public Review Draft

Proposed Addendum o to Standard 189.1-2017

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

Second Public Review Draft (February 2020)  
(Draft Shows Proposed Independent Substantive  
Changes to Previous Public Review Draft)

This draft has been recommended for public review by the responsible project committee. To submit a comment on this proposed standard, go to the ASHRAE website at [www.ashrae.org/standards-research--technology/public-review-drafts](http://www.ashrae.org/standards-research--technology/public-review-drafts) and access the online comment database. The draft is subject to modification until it is approved for publication by the Board of Directors and ANSI. Until this time, the current edition of the standard (as modified by any published addenda on the ASHRAE website) remains in effect. The current edition of any standard may be purchased from the ASHRAE Online Store at [www.ashrae.org/bookstore](http://www.ashrae.org/bookstore) or by calling 404-636-8400 or 1-800-727-4723 (for orders in the U.S. or Canada).

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**(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)**

## Foreword

The first public review identified a number of requirements from Section 5 of Standard 189.1 as being appropriate for local jurisdictions to consider excluding from their adopting ordinances. In response to the first public review, public-use walkways (5.3.7.1.1.1), bicycle paths (5.3.7.1.2) and greenfield sites (5.3.3.2) will become a core requirement and not an option for jurisdictions to exclude.

*[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard 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 changes.]*

## Addendum o 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:*

### 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**

SECTION	SECTION TITLE OR DESCRIPTION AND DIRECTIVES	Jurisdictional Requirement
5.3.3.2	<del>Greenfield Sites</del>	<input checked="" type="checkbox"/> <del>No</del>
5.3.5.2	Mitigation of Heat Island Effect, Walls	<input type="checkbox"/> No
5.3.6	Reduction of Light Pollution	<input type="checkbox"/> No
<del>5.3.7.1.1.1</del>	<del>Public Frontage Walkway</del>	<input checked="" type="checkbox"/> <del>No</del>
<del>5.3.7.1.2</del>	<del>Bicycle Paths</del>	<input checked="" type="checkbox"/> <del>No</del>
5.3.7.2.2	Bicycle Parking, Location	<input type="checkbox"/> No
5.3.7.2.3	Bicycle Parking, Horizontal Parking Racks	<input type="checkbox"/> No
5.3.7.2.5	Bicycle Parking, Security and Visibility	<input type="checkbox"/> No
5.3.8.1	Building Site Waste Management – Diversion Percentage	<input type="checkbox"/> 75% <input type="checkbox"/> 50%

**4.3 References and Appendices.**

**4.3.1 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.

**4.3.2 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.

**4.3.3 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.

**4.3.4 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.

*Add [JO] following the section number to indicate that Section 5.3.3.2 is a jurisdictional option:*

**5.3.3 Plants**

**5.3.3.1 Invasive Plants.** *Invasive plants* shall be removed from the *building project site* and destroyed or disposed of in a land fill. *Invasive plants* shall not be planted on the *building project site*.

**5.3.3.2 [JO] Greenfield Sites**

- a. **More than 20% existing native or adapted plants:** Where more than 20% of the area of the predevelopment *site* has existing *native plants* or *adapted plants*, a minimum of 20% of the area of *native plants* or *adapted plants* shall be retained.
- b. **Less than 20% existing native or adapted plants:**

1. Where 20% or less of the area of the predevelopment *site* has existing *native plants* or *adapted plants*, a minimum of 20% of the *site* shall be developed or retained as vegetated area. Such vegetated areas include bioretention facilities, rain gardens, filter strips, grass swales, vegetated level spreaders, constructed *wetlands*, planters, and open *space* with plantings.
2. A minimum of 60% of the vegetated area shall consist of *biodiverse planting* of *native plants* ~~and/or~~ *adapted plants* other than *turfgrass*.

**Exception to 5.3.3.2(b)(2):** The following areas shall not be included in the calculations: dedicated sports fields, driving ranges, burial grounds, vegetated pavers, and the minimum fire lanes required by the jurisdiction.

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*Add [JO] following the section number to indicate that Section 5.3.5.2 is a jurisdictional option:*

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### **5.3.5 Mitigation of Heat Island Effect**

#### **5.3.5.1 Site Hardscape.** At least . . .

**5.3.5.2 [JO] Walls.** Above-grade building *walls* and retaining *walls* shall be shaded in accordance with this section. The building is allowed to be rotated up to 45 degrees to the nearest cardinal orientation for purposes of calculations and showing compliance. Compliance with this section shall be achieved through the use of shade-providing *plants*, manmade structures, existing buildings, hillsides, permanent *building projections*, *on-site renewable energy systems*, or a combination of these, using the following criteria:

- a. Shade shall be provided on at least 30% of the east and west above-grade *walls* and retaining *walls* from grade level to a height of 20 ft (6 m) above grade, or the top of the exterior *wall*, whichever is less. Shade coverage shall be calculated at 10 a.m. for the east *walls* and 3 p.m. for the west *walls* on the summer solstice.
- b. Where shading is provided by vegetation, such vegetation shall be existing trees and vegetation or new *biodiverse plantings* of *native plants* and *adapted plants*. Such planting shall occur prior to the final approval by the *AHJ* or in accordance with a contract established to require planting no later than 12 months after the final approval by the *AHJ* so as to provide the required shade no later than ten years after the final approval. Vegetation shall be appropriately sized, selected, planted, and maintained so that it does not interfere with overhead or underground utilities. Trees shall be placed a minimum of 5 ft (1.5 m) from and within 50 ft (15 m) of the building or retaining *wall*.

#### **Exceptions to 5.3.5.2:**

1. The requirements of this section are satisfied if 75% or more of the opaque *wall* surfaces on the east and west have a minimum *SRI* of 29. Each *wall* is allowed to be considered separately for this exception.
2. East *wall* shading is not required for buildings located in *Climate Zones* 5, 6, 7, and 8. West *wall* shading is not required for buildings located in *Climate Zones* 7 and 8.

#### **5.3.5.3 Roofs.** This section . . .

#### **5.3.5.4 Solar Reflectance Index (SRI).** The *SRI* . . .

#### **5.3.5.5 Vegetated Terrace and Roofing Systems.** Vegetated . . .

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*Add [JO] following the section number to indicate that Section 5.3.6 is a jurisdictional option:*

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### **5.3.6 [JO] Reduction of Light Pollution.**

**5.3.6.1 General.** Exterior lighting systems shall comply with ANSI/ASHRAE/IES Standard 90.1, Sections 9.1, 9.4.1.4, 9.4.2, 9.4.3, and 9.7, and with Sections 5.3.6.2 and 5.3.6.3 of this standard.

**5.3.6.2 Backlight and Glare.**

- a. All building-mounted luminaires located less than two mounting heights from any property line shall meet the maximum allowable glare ratings in Table 5.3.6.2A.
- b. All other luminaires shall meet the maximum allowable backlight and glare ratings in Table 5.3.6.2B.

**5.3.6.3 Uplight.** All exterior lighting shall meet one of the following uplight requirements:

- a. Exterior luminaires shall meet the maximum allowable Uplight Ratings of Table 5.3.6.2B.
- b. Exterior lighting shall meet the uplight requirements of Table 5.3.6.3.

**Exceptions to 5.3.6.3:**

- 1. Lighting in LZ3 and LZ4, solely for uplighting structures, building façades, or landscaping.
- 2. Lighting in LZ1 and LZ2, solely for uplighting structures, building façades, or landscaping, provided the applicable lighting power densities (LPDs) do not exceed 50% of the *lighting power allowances* in ANSI/ASHRAE/IES Standard 90.1, Table 9.4.2-2.

**Exceptions to 5.3.6.2 and 5.3.6.3:**

- 1. Specialized signal, directional, and marker lighting associated with transportation.
- 2. Advertising signage or directional signage.
- 3. Lighting integral to equipment or instrumentation and installed by its manufacturer.
- 4. Lighting for theatrical purposes, including performance, stage, film production, and video production.
- 5. Lighting for athletic playing areas.
- 6. Lighting that is in use for no more than 60 continuous days and is not reinstalled any sooner than 60 days after being uninstalled.
- 7. Lighting for industrial production, material handling, transportation sites, and associated storage areas.
- 8. Theme elements in theme/amusement parks.
- 9. Roadway lighting required by governmental authorities.
- 10. Lighting classified for and used in hazardous locations as specified in NFPA 70.
- 11. Lighting for swimming pools and water features.

**Table 5.3.6.2A Maximum Allowable Glare Ratings for Building-Mounted Luminaires within Two Mounting Heights of Any Property Line<sup>a,b</sup>**

Distance in Mounting Heights to Nearest Property Line	LZ0	LZ1	LZ2	LZ3	LZ4
≥1 and <2	G0	G0	G1	G1	G2
≥0.5 and <1	G0	G0	G0	G1	G1
<0.5	G0	G0	G0	G0	G1

a. For property lines that abut public walkways, bikeways, plazas, and parking lots, the property line may be considered to be 5 ft (1.5 m) beyond the actual property line for the purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.  
 b. Backlight, uplight, and glare ratings are defined based on specific lumen limits per IES TM-15 Addendum A.

**Table 5.3.6.2B Maximum Allowable Backlight, Uplight, and Glare (BUG) Ratings<sup>a,b,c,d</sup>**

	LZ0	LZ1	LZ2	LZ3	LZ4
<b>Allowed Backlight Rating</b>					
>2 mounting heights from property line	B1	B3	B4	B5	B5
1 to 2 mounting heights from property line	B1	B2	B3	B4	B4
0.5 to 1 mounting height to property line	B0	B1	B2	B3	B3
<0.5 mounting height to property line	B0	B0	B0	B1	B2
<b>Allowed Uplight Rating</b>					
	U0	U1	U2	U3	U4
<b>Allowed Glare Rating</b>					
	G0	G1	G2	G3	G4

a. Except where installed on a building surface, luminaires that are located at a distance of two times the mounting height of the luminaire or less from a property line shall have the

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- backlight of the luminaire aimed toward and perpendicular to the nearest property line. Backlight is that part of the luminaire’s lumen output that was used to determine the backlight rating in its final angular position.
- b. For property lines that abut public walkways, bikeways, plazas, and parking lots, the property line may be considered to be 5 ft (1.5 m) beyond the actual property line for the purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.
- c. If the luminaire is installed in other than the intended manner, or is an adjustable luminaire for which the aiming is specified, the rating shall be determined by the actual photometric geometry in the aimed orientation.
- d. Backlight, uplight, and glare ratings are defined based on specific lumen limits per IES TM-15 Addendum A.

**Table 5.3.6.3 Maximum Allowable Percentage of Uplight**

	LZ0	LZ1	LZ2	LZ3	LZ4
Percentage of total exterior fixture lumens allowed to be emitted above 90 degrees or higher from nadir (straight down)	0%	0%	1%	2%	5%

*Add [JO] following the section number to indicate that Section 5.3.7.1.1.1 is a jurisdictional option:*

**5.3.7 Mitigation of Transportation Impacts**

**5.3.7.1 Pedestrian and Bicycle Connectivity**

**5.3.7.1.1 Pedestrian Walkways.** Each *primary building entrance* shall be provided with a pedestrian walkway that extends to either a *public way* or a transit stop. Walkways shall not be less than 5 ft (1.5 m) in width and shall be clearly delineated.

**5.3.7.1.1.1 [JO] Public-Use Walkway.** A public-use walkway shall be provided along the length of the adjoining public-way frontage of the *building project site*, and such walkways shall connect to adjacent public-use walkways.

*Add [JO] following the section number to indicate that Section 5.3.7.1.2 is a jurisdictional option:*

**5.3.7.1.2 [JO] Bicycle Paths.** On-site bicycle paths shall be designed to connect bicycle parking areas to existing and planned off-site bicycle paths adjacent to the *building project*.

*Add [JO] following the section numbers to indicate that Sections 5.3.7.2.2, 5.3.7.2.3, 5.3.7.2.4 and 5.3.7.2.5, are jurisdictional options:*

**5.3.7.2 Bicycle Parking**

**5.3.7.2.1 Minimum Number of Spaces.** Bicycle parking *spaces* shall be provided for at least 5% of the *occupant load* of each building but not less than two parking *spaces*. Occupants who are nonambulatory, under restraint, or under custodial care need not be included in the total *occupant load* for the building. *Building projects with dwelling units* shall be provided with at least 0.5 bicycle parking *spaces* per bedroom for each building but not less than two parking *spaces*.

**Exceptions to 5.3.7.2.1:**

1. *Building projects with dwelling units* that provide each unit with a private garage or private, locked storage *space* of sufficient size to store a bicycle.

2. The number of bicycle parking *spaces* shall be allowed to be reduced subject to *AHJ* approval of a transportation plan, prepared by a *registered design professional*, that demonstrates the likelihood that building occupants will use public transportation and/or walk to the *building project site*.

**5.3.7.2.2 [JO] Location.** Not fewer than two bicycle parking *spaces* shall be located within 50 ft (15.2 m) of, and be visible from, the *building entrance* being served. All other bicycle parking *spaces* shall be located inside the building, or the nearest point of the bicycle parking areas shall be within 50 ft (15.2 m) of the *building entrance* being served. Bicycle parking shall not obstruct pedestrian access to the building.

**5.3.7.2.3 [JO] Horizontal Parking Racks.** Horizontal bicycle parking racks shall provide a *space* for each bicycle that is not less than 18 in. (305 mm) in width and not less than 72 in. (1829 mm) in length. Each *space* shall provide at least two points of contact between the bicycle frame and rack. Each *space* shall have access to a clear exit pathway not less than 36 in. (914 mm) in width.

**5.3.7.2.4 Ability to Lock.** Each bicycle parking *space* shall be provided with a securely mounted rack or other facilities for locking or securing a bicycle. A rack shall allow the locking of the frame and the front or rear wheel of the bicycle to the rack using a U-shaped shackle lock.

**5.3.7.2.5 [JO] Security and Visibility.** All bicycle parking *spaces* shall be visible from the entrance being served; secured in a locker, cage, or room; or provided with valet service or security cameras. Signage shall be provided to identify parking that is not visible from the *building entrance*.

**5.3.7.2.6 Documentation.** *Construction documents* shall include plans and details showing compliance with Sections 5.3.7.2.1 through 5.3.7.2.5.

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*Add [JO] following the 90% diversion rate percentage in Section 5.3.8.1 to indicate that alternate values are provided as a jurisdictional option:*

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### **5.3.8 Building Site Waste Management**

**5.3.8.1 Building Site Waste Management Plan.** A building *site* waste management plan shall be developed and implemented for excavated soil, rock, and land-clearing debris. Land-clearing debris is limited to stumps and vegetation. Diverted land-clearing debris and removed rock and soil shall not be sent to *sites* where development activity is prohibited by Section 5.3.1.2 or to *greenfields* other than those being used for agricultural purposes or being developed as part of a *building project*.

Not less than 90% [JO] of the land-clearing debris, excluding *invasive plant* materials, shall be diverted from disposal in landfills and incinerators other than waste-to-energy systems with an energy-recovery efficiency rate higher than 60%. Land-clearing debris calculations shall be based on either weight or volume but not both. Receipts or other documentation related to diversion shall be maintained through the course of construction.

The plan shall address all of the following:

- a. Land-clearing debris, rock, and soil to be diverted from disposal by composting, recycling, or reuse
- b. Waste materials that will be diverted on-site
- c. The locations to which waste materials will be diverted off-site
- d. Soils to be stockpiled for future use at any location
- e. Woody waste to be used as fuel
- f. The destruction and disposal of *invasive plant* materials
- g. The methods of removal of any contaminated soils
- h. The treatment of vegetation to comply with the rules of government-designated quarantine zones for invasive insect species