Public Review Draft

Proposed Addendum TG04DA02 to Standard 189.1-2023

Standard for the Design of High-Performance Green Buildings

Except Low-Rise Residential Buildings

First Public Review (February, 2026)
(Draft Shows Proposed Changes to Current Standard)

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Foreword

This addendum is a follow-on to Addendum 189.1w (Definitions) in that it deals separately with definitions related to "*space*". 189.1 includes several such definitions which just refer to 90.1. As with 189.1-2023 Addendum w (pending publication), this addendum brings the text of the 90.1 definitions into 189.1 rather than referring to 90.1. Some wording was modified for clarity or simplification with no change to the meaning of the term.

The primary changes being made by this addendum are to delete the term *enclosed space* but combine its definition into the definition of *space*. All occurrences of *enclosed space* are then replaced by *space*.

All instances of the phrase "*space* type" are replaced with "space type" because *space* is a noun but space type is a noun phrase.

Section 8.6.1.1.1 includes *classroom spaces*. This is changed to *classrooms* because the definition of *classroom* includes that it is a *space*.

[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. Highlights are added to assist the reviewer to show the places where the changes take place. 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 af to 189.1-2023

Modify Section 3 as follows.

conditioned space: ~~see ANSI/ASHRAE/IES Standard 90.1.~~ a *cooled space*, *heated space*, or *indirectly conditioned space* defined as follows:

a. ***cooled space***: a *space* that is cooled by a *system* having a sensible cooling output capacity >= 3.4 Btu/h ft² (10 W/m²) of floor area

b. ***heated space***: a *space* heated by a *system* having an output heating capacity relative to the floor area that is

greater than or equal to the criteria in Table 3.2.

c. ***indirectly conditioned space***: a space that is not a *heated space* or a *cooled space*, which is heated or cooled indirectly by being connected to adjacent *spaces*, provided
   a. the product of the *U-factors* and surface areas of the *space* adjacent to connected *spaces* is greater than the combined sum of the product of the *U-factor*s and surface areas of the *space* adjoining the outdoors, *unconditioned spaces,* and *semiheated spaces.*
   b. that air from other *conditioned spaces* is intentionally transferred naturally or mechanically into the *space* at a rate more than 3 ach.

~~***enclosed space:*** see ANSI/ASHRAE/IES Standard 90.1.~~

semiheated space: ~~see ANSI/ASHRAE/IES Standard 90.1.~~ a *space* that is heated by a *system* whose output heating capacity is greater than or equal to 3.4 Btu/h ft² (10 W/m²) of floor area but is not a *conditioned space*.

Space: ~~see ANSI/ASHRAE/IES Standard 90.1.~~ a volume within a building that is substantially surrounded by solid surfaces, such as *walls*, *floors*, *roofs*, and openable devices, such as *doors* and operable windows. ***Informative note:*** Sometimes referred to as enclosed space.

daylight area: area in ~~an *enclosed*~~ *a space* that is in the *primary sidelighted area*, *daylight area under roof monitors*, or *daylight area under skylights*.

Table 3.2 *Heated Space* Criteria

Climate Zone	Heating Output, Btu/h·ft²	Heating Output, W/h m²
0	>5	>15
1	>5	>15
2	>5	>15
3A, 3B	>9	>27
3C	>7	>21
4A, 4B	>10	>30
4C	>8	>24
5	>12	>36
6	>14	>42
7	>16	>48
8	>19	>57

Modify Section 7.4.2.6 as follows.

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: Permanent projections are not required for the following buildings and *fenestrations*:

1. Where *vertical fenestration* is located within 18 in. (450 mm) of the lot line.
2. Where equivalent shading of the *vertical fenestration* is provided by buildings, structures,

geological formations, or permanent exterior projections that are not horizontal, as determined by sun-angle studies at the peak solar altitude on the summer solstice and three hours before and after the peak solar altitude on the summer solstice.

3. *Vertical fenestration* with automatically controlled shading devices capable of modulating in multiple steps the amount of solar gain and light transmitted into the *space* in response to daylight levels or solar intensity that comply with all of the following:
   a. Exterior shading devices shall be capable of providing at least 90% coverage of the *fenestration* in the closed position.
   b. Interior shading devices shall be capable of providing at least 90% coverage of the *fenestration* in the closed position and have a minimum solar reflectance of 0.50 for the surface facing the *fenestration*.
   c. A manual override located in the same ~~*enclosed*~~ *space* as the *vertical fenestration* shall override operation of *automatic* controls no longer than four hours.
   d. *Functional and performance testing* (*FPT*) and commissioning shall be conducted as required by Section 10.3 to verify that *automatic* controls for shading devices respond to changes in illumination or radiation intensity.
4. *Vertical fenestration* with automatically controlled *dynamic glazing* capable of modulating in multiple steps the amount of solar gain and light transmitted into the *space* in response to daylight levels or solar intensity that comply with all of the following:
   a. *Dynamic glazing* shall have a lower *labeled SHGC* equal to or less than 0.12, lowest *labeled* visible transmittance (VT) no greater than 0.05, and highest *labeled* VT no less than 0.40.
   b. A manual override located in the same ~~*enclosed*~~ *space* as the *vertical fenestration* shall override operation of *automatic* controls no longer than four hours.
   c. *FPT* and commissioning shall be conducted as required by Section 10.3 to verify that *automatic* controls for *dynamic glazing* respond to changes in illumination or radiation intensity.
5. Existing buildings undergoing alteration, repair, relocation, or a change of occupancy.

Modify Section 7.4.6.1 as follows.

7.4.6.1 Interior Lighting Power Allowance. The interior *lighting power allowance* shall be determined using ANSI/ASHRAE/IES Standard 90.1, Section 9.5, with the following modifications:

a. For those areas where the Building Area Method is used, the LPD from ANSI/ASHRAE/IES Standard 90.1, Table 9.5.1, shall be replaced with the corresponding LPD in Table 7.4.6.1A.
b. For those areas where the Space-by-Space Method is used, the LPD from ANSI/ASHRAE/IES Standard 90.1, Tables 9.5.2.1-1 and 9.5.2.1-2, shall be replaced with the corresponding LPD in Tables 7.4.6.1B and 7.4.6.1C.
c. Room geometry adjustment when using the Space-by-Space Method: ANSI/ASHRAE/IES Standard 90.1, Section 9.5.2, shall be replaced with the following. For corridor/transition *spaces* less than 8 ft (2.4 m) wide, or individual *spaces* where room cavity ratio (RCR) calculated for the empty room is documented to be greater than the RCR threshold for that ~~*space*~~ space type shown in Tables 7.4.6.1B and 7.4.6.1C, the allowed LPD shall be 1.2 times the LPD in Tables 7.4.6.1B and 7.4.6.1C. RCR shall be calculated as described in ANSI/ASHRAE/IES Standard 90.1, Section 9.5.2.4.
d. Where the Space-by-Space Method is used, the additional increase in the interior lighting power allowed by ANSI/ASHRAE/IES Standard 90.1, Section 9.5.2.2, for specific lighting functions shall be replaced by the requirements and allowances of Section 7.4.6.1.1.
e. Where the Building Area Method or Space-by-Space Method is used, the additional increase in the interior lighting power allowed by ANSI/ASHRAE/IES Standard 90.1, Section 9.5.2.3, for the use of nonmandatory controls shall be replaced by the requirements and allowances of Section 7.4.6.1.2.

Modify Footnote a to Table 7.4.6.1B and to 7.4.6.1C as follows.

a In cases where a ~~*space*~~ space type appears in both Table 7.4.6.1B and Table 7.4.6.1C, the building-specific ~~*space*~~ space type in Table 7.4.6.1C shall apply

Modify Section 8.6.1.1.1 as follows.

8.6.1.1.1 Emissions Requirements. Emissions shall be determined according to the CDPH/EHLB/ Standard Method and shall comply with the limit requirements for either offices or *classrooms* ~~*spaces,*~~ regardless of the ~~*space*~~ space type. The emissions testing shall be performed by an ISO/IEC 17025 accredited laboratory that has CDPH/EHLB/Standard Method, USEPA Method TO-17, and ASTM Standard Method D5197 within the scope of its accreditation. Third-party certifiers shall be accredited to ISO/IEC 17065 and have the relevant certification program in the scope of accreditation.

Modify Section 8.6.1.2.1 as follows.

8.6.1.2.1 Emissions Requirements. Emissions shall be determined according to CDPH/EHLB/Standard Method and shall comply with the limit requirements for either office or *classroom* spaces, regardless of the ~~*space*~~ space type. The emissions testing shall be performed by an ISO/IEC 17025 accredited laboratory that has CDPH/EHLB/Standard Method, USEPA Method TO-17, and ASTM Standard Method D5197 within the scope of its accreditation. Third-party certifiers shall be accredited to ISO/IEC 17065 and have the relevant certification program in the scope of accreditation.

Modify Section 8.6.1.3 as follows.

8.6.1.3 Floor Covering Materials. Emissions of floor covering materials installed in the building interior, and each product layer within a flooring system containing more than one distinct product layer, shall be individually determined according to CDPH/EHLB/Standard Method and shall comply with the limit requirements for either office or *classroom spaces*, regardless of the ~~*space*~~ space type. The emissions testing shall be performed by an ISO/IEC 17025 accredited laboratory that has CDPH/EHLB/Standard Method, USEPA TO-17, and ASTM Standard Method D5197 within the scope of its accreditation. Third-party certifiers shall be accredited to ISO/IEC 17065 and have the relevant certification program in the scope of accreditation.

Modify Section 8.6.1.4 as follows.

8.6.1.4 Composite Wood Products, Agrifiber Products, Hardwood Plywood Products, and Laminated Products. *Composite wood products*, *agrifiber products*, *hardwood plywood* products, and *laminated products* used inside of the building's *weatherproofing system* shall comply with one of the following:

a. For products other than those listed under Section 8.6.1.4, Exception 1, and *laminated products*, third-

party certification shall verify that these products meet the requirements for ultra-low-emitting formaldehyde resins or no-added-formaldehyde resins as defined by CARB regulation, *Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products.* Third-party certifiers shall be approved by CARB.

b. For products other than those listed under Section 8.6.1.4, Exception 1, third-party certification shall verify that these products meet the requirements for ultra-low emitting formaldehyde resins or no-added-formaldehyde resins as defined by USEPA regulation *Formaldehyde Standards for Composite Wood Products*. Third-party certifiers shall be recognized by USEPA.

c. For all products, emissions shall be determined according to CDPH/EHLB/Standard Method and shall comply with the limit requirements for either office or *classroom spaces*, regardless of the ~~*space*~~ space type. The emissions testing shall be performed by an ISO/IEC 17025 accredited laboratory that has the CDPH/ EHLB/Standard Method V.1.2, USEPA Method TO-17 and ASTM Standard Method D5197 within the scope of its accreditation. Third-party certifiers shall be accredited to ISO/IEC 17065 and have the relevant certification program in the scope of accreditation.

Laminating adhesives applied on-site to fabricate assemblies of *composite wood products* and *agrifiber products* shall contain only no-added-formaldehyde resins.

Exceptions to 8.6.1.4:

1. Structural *composite wood products* made with moisture-resistant adhesives complying with ASTM D2559 or *labeled* as bond classification Exposure 1 or Exterior, having no surface treatments with added urea-formaldehyde resins or coatings, and certified according to one of the following industry standards:
   a. Plywood: Standard PS 1, Standard PS 2, or AS/NZS 2269, BS EN 636, CSA O121, CSA O151, CSA O153, or CSA O325
   b. Oriented strand board: Standard PS 2 or *labeled* as bond classification Exposure 1 or Exterior
   c. Structural composite lumber: ASTM D5456
   d. Glued laminated timber: ANSI A190.1
   e. I-joists: ASTM D5055
   f. Cross-laminated timber: ANSI/APA PRG 320
   g. Finger-jointed lumber *labeled* "Heat Resistant Adhesive (HRA)" in accordance with Standard PS 20
2. *Office furniture systems* and *seating*.

Modify Section 8.6.1.6 as follows.

8.6.1.6 Ceiling and Wall Assemblies and Systems. Ceiling and wall assemblies and systems include acoustical treatments, ceiling panels and tiles, gypsum panel products, tackable wall panels and coverings, wall coverings, and wall and ceiling paneling and planking. Emissions from these assemblies and systems shall be determined according to CDPH/EHLB/Standard Method and shall comply with the limit requirements for either office or *classroom spaces*, regardless of the ~~*space*~~ space type. The emissions testing shall be performed by an ISO/IEC 17025 accredited laboratory that has CDPH/EHLB/Standard Method, USEPA TO-17, and ASTM Standard Method D5197 within the scope of its accreditation. Third-party certifiers shall be accredited to ISO/IEC 17065 and have the relevant program in the scope of accreditation.

Modify Section 8.6.1.7 as follows.

8.6.1.7 Insulation. Emissions shall be determined according to CDPH/EHLB/Standard Method and shall comply with the limit requirements for either office or *classroom spaces*, regardless of the ~~*space*~~ space type. The emissions testing shall be performed by an ISO/IEC 17025 accredited laboratory that has CDPH/EHLB/ Standard Method, USEPA TO-17, and ASTM Standard Method D5197 within the scope of its accreditation. Third-party certifiers shall be accredited to ISO/IEC 17065 and have the relevant certification program in the scope of accreditation.

Modify Section 8.9.3 as follows.

8.9.3 Color Rendition. At least 95% of lighting power of nominally white lighting within each ~~*enclosed*~~ *space* shall be provided by *luminaires* that meet the following criteria at full light output in accordance with IES TM-30, Annex E, P2 and F3:

a. R_f of at least 85
b. $R_{f,h1}$ of at least 85
c. R_g of at least 92
d. $R_{cs,h1}$ of at least –7% but no greater than +19%

Nominally white lighting is lighting that has chromaticity within the basic or extended nominal color correlated temperature (CCT) specifications of ANSI C78.377.

Where a lighting system is capable of changing its spectrum, it shall be capable of meeting the color rendition requirements within each nominal CCT of 2700 K, 3500 K, 4000 K, and 5000 K, as defined in ANSI C78.377, that the system is capable of delivering.

Lighting systems where spectrum changes through dimming alone shall meet the color rendition requirements at full light output.

Modify Section 8.10.1 as follows.

8.10.1 Daylighting in Large Spaces Directly under a Roof and Having High Ceilings. ~~*Enclosed spaces*~~ *Spaces*, including ~~conditioned~~ *conditioned* and ~~unconditioned~~ *unconditioned spaces*, meeting all of the following criteria, shall comply with Sections 8.10.1.1, 8.10.1.2 and 8.10.1.3:

a. The *space* is in a building with three stories or fewer above grade.
b. The *space* area is greater than 2500 ft^2 (232 m^2).
c. The *space* is located directly under a *roof*, and average ceiling heights are greater than 15 ft (4.6 m).

Exception to 8.10.1:

1. *Spaces* in buildings located in Climate Zones 7 or 8.
2. Auditoria, motion picture theaters, performing arts theaters, museums, places of worship, and refrigerated warehouses.
3. ~~*Enclosed spaces*~~ *Spaces* where documentation shows that existing structures or natural objects block direct sunlight on at least 50% of the *roof* over the ~~*enclosed*~~ *space* at all three of the following times on the date of the spring equinox: three hours before solar noon (peak solar altitude), at solar noon, and three hours after solar noon.

Modify Section 8.10.1.2 as follows.

8.10.1.2 Visible Transmittance (VT) of Skylights and Roof Monitors. The visible transmittance of *skylights* and *roof monitors* for *daylight areas* used to comply with Section 8.10.1.1 shall not be less than 0.40. For *dynamic glazing,* the highest-*labeled* VT shall be used for compliance with this section.

Exception to 8.10.1.2: ~~*Enclosed spaces*~~ *Spaces* that have a *skylight effective aperture* of not less than 1%.

Modify Section 8.10.1.4 as follows.

8.10.1.4 Minimum Daylight. The computed area-weighted *sDA* shall not be less than 40%. The *sDA* within each *space* shall be calculated in accordance with the methodology of IES LM 83. Calculations shall be made on the basis of 28 fc (300 lux) for all *spaces*, with the exception of the following ~~*space*~~ space types, which shall be calculated on the basis of 14 fc (150 lux): post-office sorting areas, gymnasia, big-box retail, transportation facility terminal ticket counters, airport concourses, and nonrefrigerated warehouses.

Modify Section 8.12 as follows.

8.12 Exterior Views. Not less than 50% of the total combined floor area of each of the ~~*space types*~~ space types listed in Table 8.12 shall have a direct line-of-sight, originating at a height of not more than 42 in. (1.1 m) above the floor, to *view fenestration* meeting the criteria of this section. The line-of-sight distance to *view fenestration* shall not exceed 40 ft (12.2 m). The glazing area shall not be less than 8% of the floor area required to have exterior views. Qualifying *view fenestration* shall meet the following criteria:

a. Glazing shall have a haze value less than 3%, as determined in accordance with ASTM D1003.
b. Center-of-glass visible transmittance (VT) shall be not less than 20%.
c. The product of the center-of-glass VT and the openness factor of screens, patterned films, and ceramic frits shall be not less than 20%.
d. Where *dynamic glazing* is provided, glazing shall have a center-of-glass VT of not less than 20% at the highest setting of its VT range.
e. Where stationary opaque window treatments are provided, such as nonoperable blinds, shades, and louvers, such treatments shall not obstruct more than 40% of the *fenestration* glazing area.