

ANSI/ASHRAE/USGBC/IES Addenda c, d, e, h, j, k, and o to

ANSI/ASHRAE/USGBC/IES
Standard 189.1-2009

Standard for the Design of High-Performance Green Buildings

Except Low-Rise Residential Buildings

Approved by the ASHRAE Standards Committee on June 25, 2011; by the ASHRAE Board of Directors on June 29, 2011; by the USGBC Board of Directors on June 20, 2011; by the IES Board of Directors on June 27, 2011; and by the American National Standards Institute on June 30, 2011.

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FOREWORD

This addendum groups outdoor air definitions for easier reference. It deletes (b) and (c) in Section 8.3.1.1, which were needed for the 30% more air requirement in previous public reviews of Standard 189.1. These paragraphs could cause confusion with how ASHRAE Standard 62.1 uses the phrase “design outdoor air.” The addendum does not change the requirements of the standard, because the definitions are reorganized and outdoor airflow rates are still permitted to be greater than the minimum requirements. The current definition of design outdoor airflow rate is being proposed for deletion, and the occurrences of this term in the standard are being modified to be more clear.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strike through~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum c to Standard 189.1-2009

Modify the standard as follows.

Group the following definitions in Section 3.2, create cross-references, and modify Sections 7.4.3.8, 8.3.1.1, and 10.3.1.4 as follows:

air, outdoor: see ASHRAE Standard 62.1.

airflow rate, minimum outdoor: the rate of outdoor airflow provided by a ventilation system when running when all densely occupied spaces with demand control ventilation are unoccupied.

~~**design outdoor airflow rate:** the minimum required rate of outdoor airflow which must be provided by a ventilation system at design occupancy.~~

~~**minimum outdoor airflow rate:** see airflow rate, minimum outdoor. the rate of outdoor airflow provided by a ventilation system when running when all densely occupied spaces with demand control ventilation are unoccupied.~~

outdoor air: see air, outdoor. see ASHRAE Standard 62.1.

7.4.3.5 Zone Controls. Exception (a) to Section 6.5.2.1 of ANSI/ASHRAE/IESNA Standard 90.1 shall be replaced by the following: zones for which the volume of air that is reheated, re-cooled, or mixed is not greater than the larger of (1) the ~~design~~ outdoor airflow rate provided to the zone at design occupancy, or (2) 15% of the zone design peak supply rate.

...

7.4.3.8 Exhaust Air Energy Recovery. Each fan system shall have an energy recovery system when the system's supply airflow rate exceeds the value listed in Table 7.4.3.8 based on the climate zone and percentage of outdoor air provided by the ventilation system at design conditions occupancy. Where a single room or space is supplied by multiple units, the aggregate supply cfm (L/s) of those units shall be used in applying this requirement.

...

8.3.1.1 Minimum Ventilation Rates.

- a. The Ventilation Rate Procedure of ASHRAE Standard 62.1 shall be used to ~~design each mechanical ventilation system in the building.~~
- b. ~~The zone level design outdoor airflow rates in all occupiable spaces shall be greater than or equal to the airflow calculated using the Ventilation Rate Procedure in Section 6.2 of ASHRAE Standard 62.1.~~
- e. ~~The system level design outdoor airflow rate calculation (Section 6.2.3 through 6.2.5 of ASHRAE Standard 62.1) shall be based on the zone level design outdoor airflow rates calculated in 8.3.1.1 (b).~~

...

10.3.1.4 Indoor Air Quality (IAQ) Construction Management. Develop and implement an indoor air quality (IAQ) construction management plan to include the following:

- a. Air conveyance materials shall be stored and covered so that they remain clean. All filters and controls shall be in place and operational when HVAC systems are operated during building “flush-out” or baseline IAQ monitoring. Except for system startup, testing, balancing, and commissioning, permanent HVAC systems shall not be used during construction.
- b. After construction ends, prior to occupancy and with all interior finishes installed, a post-construction, pre-occupancy building flush-out as described under Section 10.3.1.4 (b) 1, or post-construction, pre-occupancy baseline IAQ monitoring as described under Section 10.3.1.4 (b) 2 shall be performed:
 - 1. Post-Construction, Pre-Occupancy Flush-Out: A total air volume of *outdoor air* in total air changes as defined by Equation 10.3.1.4 shall be supplied while maintaining an internal temperature of a minimum of 60°F (15°C) and relative humidity no higher than 60%. For buildings located in non-attainment areas, filtration and/or air cleaning as described in Section 8.3.1.3 shall be supplied when the Air Quality Index forecast exceeds 100 (category orange, red, purple, or maroon). One of the following options shall be followed:
 - a. Continuous Post-Construction, Pre-Occupancy Flush-Out: The flush-out shall be continuous and ~~the~~ supplied at an outdoor airflow *outdoor air* rate shall be no less than determined in Section 8.3.1.1 the design minimum.

- b. Continuous Post-Construction, Pre-Occupancy/ Post-Occupancy Flush-Out: If occupancy is desired prior to completion of the flush-out, the space is allowed to be occupied following delivery of half of the total air changes calculated from Equation 10.3.1.4 to the space. The space shall be ventilated at a minimum rate of 0.30 cfm per ft² (1.5 L/s per m²) of *outdoor air* or the ~~*design outdoor airflow rate*~~ *outdoor airflow rate* determined in Section 8.3.1.1, whichever is greater. These conditions shall be maintained until the total air changes calculated according to Equation 10.3.1.4 have been delivered to the space. The flush out shall be continuous.
2. Post-Construction, Pre-Occupancy Baseline IAQ Monitoring: Baseline IAQ testing shall be conducted after construction ends and prior to occupancy. The ventilation system shall be operated continuously within ±10% of the ~~design outdoor airflow rate~~ outdoor airflow rate provided by the ventilation system at design occupancy for a minimum of 24 hours prior to IAQ monitoring. Testing shall be done using protocols consistent with the USEPA Compendium of Methods for the Determination of Toxic Organic Pollutants in Ambient Air, TO-1, TO-11, TO-17 and ASTM Standard Method D 5197. The testing shall demonstrate that the contaminant maximum concentrations listed in Table 10.3.1.4 are not exceeded in the return airstreams of the HVAC systems that serve the space intended to be occupied. If the return airstream of the HVAC system serving the space intended to be occupied cannot be separated from other spaces either already occupied or not occupied at all, for each portion of the building served by a separate ventilation system, the testing shall demonstrate that the contaminant maximum concentrations at *breathing zone* listed in Table 10.3.1.4 are not exceeded in the larger of the following number of locations: (a) no less than one location per 25,000 ft² (2500 m²) or (b) in each contiguous floor area. For each sampling point where the maximum concentration limits are exceeded conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to demonstrate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting non-complying building areas, take samples from the same locations as in the first test.

Equation 10.3.1.4:

$$\text{TAC} = V_{ot} \times 1/A \times 1/H \times 60 \text{ min/h} \\ \times 24 \text{ h/day} \times 14 \text{ days} \quad (\text{I-P})$$

$$\text{TAC} = V_{ot} \times 1 \text{ m}^3/1000 \text{ L} \times 1/A \times 1/H \\ \times 3600 \text{ s/h} \times 24 \text{ h/day} \times 14 \text{ days} \quad (\text{SI})$$

where

TAC = total air changes

V_{ot} = system design *outdoor air* intake flow cfm (L/s) (according to Equation 6-8 of ANSI/ASHRAE Standard 62.1)

A = floor area ft² (m²)

H = ceiling height, ft (m)

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FOREWORD

Standard 189.1-2009 references CA/DHS/EHLB/R-174 (commonly referred to as California Section 01350). In February of 2010, this document was updated, and this addendum modifies the standard to update the reference to CDPH/EHLB/Standard Method V1.1 (commonly referred to as California Section 01350).

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~striking through~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum d to Standard 189.1-2009

Modify the standard as follows.

Change all instances of “CA/DHS/EHLB/R-174 (commonly referred to as California Section 01350)” and “CA/DHS/EHLB/R-174” to “CDPH/EHLB/Standard Method V1.1 (commonly referred to as California Section 01350)” as follows:

8.4.2.1 Emissions Requirements. Emissions shall be determined according to ~~CA/DHS/EHLB/R-174 (commonly referred to as California Section 01350)~~ CDPH/EHLB/Standard Method V1.1 (commonly referred to as California Section 01350) and shall comply with the limit requirements for either office or *classroom* spaces regardless of the space type.

....

8.4.2.2.1 Emissions Requirements. Emissions shall be determined according to ~~CA/DHS/EHLB/R-174 (commonly referred to as California Section 01350)~~ CDPH/EHLB/Standard Method V1.1 (California Section 01350) and shall comply with the limit requirements for either office or classroom spaces regardless of the space type.

....

8.4.2.3 Floor Covering Materials. Floor covering materials installed in the building interior shall comply with the following:

- a. Carpet: Carpet shall be tested in accordance with and shown to be compliant with the requirements of ~~CA/DHS/EHLB/R-174 (commonly referred to as California Section 01350)~~ CDPH/EHLB/Standard Method V1.1 (California Section 01350). Products that have been verified and labeled to be in compliance with Section 9 of the ~~CA/DHS/EHLB/R-174~~ CDPH/EHLB/Standard Method

V1.1 (California Section 01350) comply with this requirement.

- b. Hard surface flooring in office spaces and *classrooms*: Materials shall be tested in accordance with and shown to be compliant with the requirements of ~~CA/DHS/EHLB/R-174 (commonly referred to as California Section 01350)~~ CDPH/EHLB/Standard Method V1.1 (California Section 01350).

8.4.2.4 Composite Wood, Wood Structural Panel and Agrifiber Products. Composite wood, wood structural panel, and agrifiber products used on the interior of the building (defined as inside of the *weatherproofing system*) shall contain no added urea-formaldehyde resins. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifiber assemblies shall contain no added urea-formaldehyde resins. Composite wood and agrifiber products are defined as: particleboard, medium density fiberboard (MDF), wheatboard, strawboard, panel substrates, and door cores. Materials considered furniture, fixtures and equipment (FF&E) are not considered base building elements and are not included in this requirement. Emissions for products covered by this section shall be determined according to and shall comply with one of the following:

- a. Third-party certification shall be submitted indicating compliance with the California Air Resource Board's (CARB) regulation, *Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products*. Third-party certifier shall be approved by CARB.
- b. ~~CA/DHS/EHLB/R-174 (commonly referred to as California Section 01350)~~ CDPH/EHLB/Standard Method V1.1 (California Section 01350) and shall comply with the limit requirements for either office or classroom spaces regardless of the space type.

...

8.4.2.6 Ceiling and Wall Systems. These systems include ceiling and wall insulation, acoustical ceiling panels, tackable wall panels, gypsum wall board and panels, and wall coverings. Emissions for these products shall be determined according to ~~CA/DHS/EHLB/R-174 (commonly referred to as California Section 01350)~~ CDPH/EHLB/Standard Method V1.1 (California Section 01350) and shall comply with the limit requirements for either office or classroom spaces regardless of the space type.

...

8.5.2 Materials. The emissions of all the materials listed below and used within the building (defined as inside of the *weatherproofing system* and applied onsite) shall be modeled for individual VOC concentrations. The sum of each individual VOC concentration from the materials listed below shall be shown to be in compliance with the limits as listed in Section 4.3 of the ~~CA/DHS/EHLB/R-174 (commonly referred to as California Section 01350)~~ CDPH/EHLB/Standard Method V1.1 (California Section 01350) and shall be compared to 100% of its corresponding listed limit. In addition, the modeling for the building shall include at a minimum

the criteria listed in Normative Appendix F. Emissions of materials used for modeling VOC concentrations shall be obtained in accordance with the testing procedures of ~~CA/DHS/EHLB/R-174~~ CDPH/EHLB/Standard Method V1.1 (California Section 01350) unless otherwise noted below.

Modify Appendix F as follows:

F1 BUILDING CONCENTRATIONS

Building concentrations shall be estimated based on the following parameters and criteria:

- a. Laboratory-measured VOC emission factors and actual surface area of all materials as described in (b) below.
....
- i. The estimated building concentration, C_{Bi} (µg/m³), of each target VOC shall be calculated using Equation 2 of the ~~CA/DHS/EHLB/R-174~~ CDPH/EHLB/Standard Method V1.1 (California Section 01350), as shown below. Estimated building concentrations of individual target VOCs with multiple sources shall be added to establish a single total estimated building concentration for individual target VOCs.

Modify Section 11 as follows:

California Department of Public Health (CDPH)
Indoor Air Quality Section
 850 Marina Bay Parkway
 Richmond, CA 94804
 1-510-620-2802
<http://www.cdph.ca.gov/programs/IAQ/>
<http://www.cal-iaq.org/>

~~CA/DHS/EHLB/R-174~~
CDPH/EHLB/Standard Method V1.1

~~Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers~~
Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers—Version 1.1

8.4.2.1.1, 8.4.2.2.1, 8.4.2.3, 8.4.2.4, 8.4.2.6, 8.5.2, Table 10.3.1.4, Appendix F

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FOREWORD

This addendum clarifies the requirements of Section E1.1, corrects cited references in Section 11, and adds one reference as it relates to the clarifications made in Appendix E. All requirements remain the same.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strike through~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum e to Standard 189.1-2009

Modify the standard as follows.

Add the following to Section 3.2, Definitions:

private office workstation. See ANSI/BIFMA M7.1.

open plan workstation. See ANSI/BIFMA M7.1.

Modify Section E1.1 of Normative Appendix E as follows:

E1.1 At least 95% of the total number of installed office furniture system workstations and at least 95% of the total number of seating units installed shall ~~have emissions concentrations or factors in compliance with the following criteria as~~

~~defined in ANSI/BIFMA Standard X7.1 at 168 hours, comply with either of the following criteria at 168 hours:~~

- a. ~~Emissions concentration limits as shown in Table E1.1 and defined in Section 4.2.1 of ANSI/BIFMA X7.1~~
- b. ~~Emission factors as shown in Table E1.2 and defined in Section 7.6.1 of BIFMA e3.~~

Table E1.1 Workstation Systems and Seating Office Emissions Concentration Limits

Chemical Contaminant	Workstation Emission Limits	Seating Emission Limits
TVOC _{toluene}	≤ 0.5 mg/m ³	≤ 0.25 mg/m ³
Formaldehyde	≤ 50 ppb	≤ 25 ppb
Total Aldehydes	≤ 100 ppb	≤ 50 ppb
4-Phenylcyclohexene	≤ 0.0065 mg/m ³	≤ 0.00325 mg/m ³

Table E1.2 Individual Furniture Components Maximum Emission Factors

	ANSI/BIFMA M7.1 Open Plan Workstation	ANSI/BIFMA M7.1 Private Office Workstation
Formaldehyde, ($\mu\text{g}/\text{m}^2 \text{ hr}$)	42.3	85.1
TVOC, ($\mu\text{g}/\text{m}^2 \text{ hr}$)	345	694
Total Aldehyde, ($\mu\text{mol}/\text{m}^2 \text{ hr}$)	2.8	5.7
4- Phenylcyclohexene, ($\mu\text{g}/\text{m}^2 \text{ hr}$)	4.5	9.0

Modify Section 11, Normative References, as follows:

The Business and Institutional Furniture Manufacturer's Association (BIFMA)
 678 Front Avenue NW, Suite 150
 Grand Rapids, MI 49504-5368
 E-mail: email@bifma.org
 1-616-285-3963; ~~www.bifma.com~~ www.bifma.org

ANSI/BIFMA M7.1-2007	Standard Test Method For Determining VOC Emissions From Office Furniture Systems, Components And Seating	8.5.2 and Appendix E
<u>ANSI/BIFMA X7.1-2007</u>	Standard for Formaldehyde and TVOC Emissions of Low-Emitting Office Furniture Systems and Seating	Appendix E
<u>BIFMA e3-2008</u>	Furniture Sustainability Standard	<u>Appendix E</u>

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FOREWORD

The purpose of this addendum is to update Standard 189.1-2009 to reference Standard 90.1-2010 instead of Standard 90.1-2007 and the resulting changes that are required to Section 7.4.3 heating, ventilating, and air conditioning requirements.

In this foreword, section numbers match the section numbers found in Standard 189.1-2009. Some sections are deleted and the subsequent sections are renumbered.

The following sections have been revised:

- *Section 7.4.3.3 requirements for duct and plenum leakage have been eliminated, as the requirements in Standard 90.1-2010 now match the requirements of Standard 189.1-2009.*
- *Former Section 7.4.3.4 (now Section 7.4.3.3) requirements for economizers have been revised and switched to reference Standard 90.1-2010 except for the size requirements and the requirements on number of capacity stages for small systems. Standard 90.1-2010 includes significant changes to the economizer requirements, which match or exceed the requirements of Standard 189.1-2009.*
- *Table 7.4.3.4.B for the economizer high-limit shutoff controls has been eliminated because the requirements of Standard 90.1-2010 have been enhanced, plus new industry research has shown that differential enthalpy is not an ideal control because of sensor inaccuracies. Section 7.4.3.5 now requires that Table 6.5.3.1.1A in Standard 90.1-2010 be used.*
- *Table 7.4.3.4C, which defines the incremental requirements for the elimination of economizers, has been eliminated, as it was not as comprehensive as the new Table 6.3.2 in Standard 90.1-2010, which covers more weather zones and can be applied to both air and water economizers.*
- *Section 7.4.3.7, which defines the control requirements for fans, has been eliminated because the new Section 6.4.3.10 of Standard 90.1-2010 defines the same requirements and also has additional requirements that are needed.*
- *Section 7.4.3.8 for energy recovery requirements has been modified to reference the requirements of Section 6.5.6.1 in Standard 90.1-2010, which have additional details, with the exception that the requirements of Standard 189.1, Table C-9, should be used and the minimum effectiveness shall be 60% instead of 50%.*

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~striking through~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum h to Standard 189.1-2009

Modify the standard as follows.

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

7.4.3.1 Minimum Equipment Efficiencies. Projects shall comply with one of the following:

- EPAct baseline.** Products shall comply with the minimum efficiencies addressed in the National Appliance Energy Conservation Act (NAECA), Energy Policy Act (EPAct), and the Energy Independence and Security Act (EISA).
- Higher Efficiency.** Products shall comply with the greater of the ENERGY STAR requirements in Section 7.4.7.3 and the values in Normative Appendix C. These requirements supersede the requirements in Tables 6.8.1A to 6.8.1J of ANSI/ASHRAE/ IESNA Standard 90.1. The building project shall comply with Sections 7.4.1.1 and 7.4.5.1 with the following modifications:

...

7.4.3.2 Ventilation Controls for Densely Occupied Spaces. *DCV* is required for *densely occupied spaces*. This requirement supersedes the occupant density threshold in Section 6.4.3.9 of ANSI/ASHRAE/ IESNA Standard 90.1.

~~**7.4.3.3 Duct and Plenum Leakage.** For duct sealing, Seal Level A shall be used. This requirement supersedes the requirements in Table 6.4.4.2A of ANSI/ASHRAE/IESNA Standard 90.1.~~

Renumber the subsequent sections accordingly.

Rename Table 7.4.3.4A to Table 7.4.3.3 and delete Table 7.4.3.4B in its entirety.

~~**7.4.3.4**~~**7.4.3.3 Economizers.** Systems shall have economizers meeting the requirements in Section 6.5.1 of ANSI/ASHRAE/ IESNA 90.1 except as noted below.

1. The minimum size requirements for economizers are defined in Table 7.4.3.4A~~3~~ and supersede the requirements in Table 6.5.1 of ANSI/ASHRAE/ IESNA Standard 90.1.
- ~~2.~~ **High limit controls shall comply with Table 7.4.3.4B.**
- ~~3.~~**2.** Rooftop units with a capacity of less than 60,000 Btu/h (18 kW) shall have two stages of capacity control, with the first stage used for cooling with the economizer and the second stage to add mechanical cooling.
- ~~4.~~**3.** For systems that control to a fixed leaving air temperature (i.e., *VAV* systems), the system shall be capable of resetting the supply air temperature up at least 5°F (3°C) during economizer operation.

TABLE 7.4.3.4A—TABLE 7.4.3.3 Minimum System Size for Which an Economizer is Required

Climate Zones	Cooling Capacity for Which an Economizer is Required ^a
1A, 1B, 2A-	No economizer requirement
2A, 2B, 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 5C, 6A, 6B, 7, 8	733,000 Btu/h (9.7 kW) ^a

^a Where economizers are required, the total capacity of all systems without economizers shall not exceed 480,000 Btu/h (140 kW) per building or 20% of the building's air economizer capacity, whichever is greater.

Exceptions: All the exceptions in Sections 6.5.1 and 6.5.1.3 of ANSI/ASHRAE/IESNA Standard 90.1 shall apply except as noted below.

1. ~~For units requiring an airside economizer, the economizer is allowed to be eliminated if: for products with an IEER part load minimum requirement, the product IEER rating exceeds the minimum level defined in Appendix C by the percentage shown in the Table 7.4.3.4C or, for products with only a full load minimum metric (EER or SEER), the full load efficiency exceeds the minimum level defined in Appendix C by the percentage shown in the Table 7.4.3.4C.~~
1. The use of Exception (i) to Section 6.5.1 of ANSI/ASHRAE/IES Standard 90.1 shall be permitted to eliminate the economizer requirement provided the requirements in Table 6.3.2 of ANSI/ASHRAE/IES Standard 90.1 are applied to the efficiency requirements required by Section 7.4.3.1.
2. For water-cooled units with a capacity less than 54,000 Btu/h (16 kW) that are used in systems where heating and cooling loads are transferred within the building (i.e., water-source heat pump systems), the requirement for an air or water economizer can be eliminated if the condenser-water temperature controls are capable of being set to maintain full load heat rejection capacity down to a 55°F (12°C) condenser-water supply temperature and the HVAC equipment is capable of operating with a 55°F (12°C) condenser-water supply temperature.
3. ~~All economizers shall have integrated economizer controls as defined by Section 6.5.1.3 of ANSI/ASHRAE/IESNA Standard 90.1, but Exception 6.5.1.3 (c) shall not apply.~~

~~**7.4.3.47-7.4.3.5 Zone Controls.** The exceptions to Exception (a) to Section 6.5.2.1 of ANSI/ASHRAE/IESNA Standard 90.1 shall be replaced by the following: zones for which the volume of air that is reheated, re-cooled, or mixed is not greater than the larger of (1) the design outdoor airflow rate for the zone, or (2) 15% of the zone design peak supply rate, modified as follows:~~

1. ~~Exception (a) shall not be used.~~
2. ~~Exception (b)1.ii shall be replaced by the following text: “the design outdoor airflow rate for the zone”.~~

~~**7.4.3.6-7.4.3.5 Fan System Power Limitation.** Systems shall have fan power limitations 10% below limitations specified in Table 6.5.3.1.1A of ANSI/ASHRAE/IESNA Standard~~

90.1. This requirement supersedes the requirement in Section 6.5.3.1 and Table 6.5.3.1.1A of ANSI/ASHRAE/IESNA Standard 90.1. All exceptions in Section 6.5.3.1 of ANSI/ASHRAE/IESNA Standard 90.1 shall apply.

Delete Table 7.4.3.4C in its entirety.

Renumber Table 7.4.3.8 (I-P) and Table 7.4.3.8 (SI) to Table 7.4.3.6 (I-P) and Table 7.4.3.6 (SI), respectively:

~~**TABLE 7.4.3.8—Table 7.4.3.6 Energy Recovery Requirement (I-P)**~~

~~**TABLE 7.4.3.8—Table 7.4.3.6 Energy Recovery Requirement (SI)**~~

Delete Section 7.4.3.7 in its entirety.

Renumber the subsequent sections accordingly.

~~**7.4.3.8—7.4.3.6 Exhaust Air Energy Recovery.** The exhaust air energy recovery requirements defined in Section 6.5.6.1 of ANSI/ASHRAE/IES Standard 90.1 shall be used except that the energy recovery effectiveness shall be 60% and the requirements of Table 7.4.3.6 shall be used instead of those of Table 6.5.6.1 of ANSI/ASHRAE/IES Standard 90.1. Each fan system shall have an energy recovery system when the system's supply airflow rate exceeds the value listed in Table 7.4.3.8 based on the climate zone and percentage of outdoor air at design conditions. Where a single room or space is supplied by multiple units, the aggregate supply cfm (L/s) of those units shall be used in applying this requirement.~~

~~Energy recovery systems required by this section shall have at least 60% energy recovery effectiveness. Sixty percent energy recovery effectiveness shall mean a change in the enthalpy of the outdoor air supply equal to 60% of the difference between the outdoor air and return air enthalpies at design conditions. Provisions shall be made to bypass or control the energy recovery system to permit air economizer operation as required by Section 7.4.3.4.~~

~~**7.4.3.9—7.4.3.7 Variable-Speed Fan Control for Commercial Kitchen Hoods.** In addition to the requirements in Section 6.5.7.1 of ANSI/ASHRAE/IESNA Standard 90.1, commercial kitchen Type I and Type II hood systems shall have variable-speed control for exhaust and makeup air fans to reduce hood airflow rates at least 50% during those times when cooking is not occurring and the cooking appliances are up to temperature in a standby, ready-to-cook mode. All exceptions in Section 6.5.7.1 of ANSI/ASHRAE/IESNA Standard 90.1 shall apply.~~

~~7.4.3.10~~ **7.4.3.8 Duct Insulation.** Duct insulation shall comply with the minimum requirements in Tables C-9 and C-10 in Normative Appendix C. These requirements supersede the requirements in Tables 6.8.2A and 6.8.2B of ANSI/ASHRAE/IESNA Standard 90.1.

~~7.4.3.11~~ **Pipe Insulation.** Pipe insulation shall comply with the minimum requirements in Table C-11 in Normative Appendix C. These requirements supersede the requirements in Table 6.8.3 of ANSI/ASHRAE/IESNA Standard 90.1. The exceptions a through e in Section 6.4.4.1.3 of ANSI/ASHRAE/IESNA Standard 90.1 shall apply.

~~7.4.3.12~~ **7.4.3.9 Automatic Control of HVAC and Lights in Hotel/Motel Guest Rooms.** In hotels and motels with over 50 guest rooms, the lighting switched outlets, television, and HVAC equipment serving each guest room shall be automatically controlled such that the lighting, switched outlets, and televisions will be turned off and the HVAC setpoint raised at least 5°F (3°C) in the cooling mode and lowered at least 5°F (3°C) in the heating mode whenever the guest room is unoccupied.

~~**TABLE 7.4.3.8**~~

Delete Table C-11 (I-P) and Table C-11 (SI) in their entirety.

(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

This addendum updates Section 7.5 and Normative Appendix D by incorporating the criteria in ANSI/ASHRAE/IES Standard 90.1-2010. Standard 90.1-2010 includes a Normative Appendix G, unlike the 2007 edition, in which Appendix G was an Informative Appendix. Normative Appendix D in Standard 189.1-2009 contains many requirements similar to those in Informative Appendix G of Standard 90.1-2007 but is written in normative language. In response to the updates in Standard 90.1-2010, this addendum replaces the current text of Appendix D with references to Normative Appendix G of Standard 90.1-2010 and modifications and additions needed to make Appendix D consistent with the requirements in Section 7. The following summarizes the changes:

- All projects complying with Section 7.2(b), the Performance Option, will follow the modeling rules in Appendix G of Standard 90.1-2010. While Appendix G of Standard 90.1 is intended to apply only to projects exceeding the requirements of that standard, in Standard 189.1 it applies to projects that meet or exceed the requirements of the standard.
- Four definitions used in Appendix D are added with references to Standard 90.1.
- A portion of Section 7.5.2(a) is deleted, as Appendix D now contains all requirements for modeling of the baseline building design. Section 7.5.2(b) has been moved to Table D1.1.
- The requirements in Sections D1.1.1, D1.1.2, and D1.1.3 require compliance with relevant sections of the standard in addition to the requirements in Normative Appendix G of Standard 90.1.
- Section D1.1.4 modifies the procedure for determining energy rates for on-site generated renewable energy to maintain consistency with Section 7, which, unlike Standard 90.1, contains prescriptive requirements for on-site renewable energy.
- Section D1.1.5 incorporates the additional hood exhaust requirements in Section 7.
- The requirements in Section D1.1.6 modify the ventilation modeling requirements. Section D1.1.6(a) incorporates the DCV requirements in Section 7. Section D1.1.6(b) removes the exception limiting the ventilation rate in the baseline building design, consistent with the 2009 version of Normative Appendix D and with the requirements in Section 7.
- Sections D1.1.7, D1.1.8, D1.1.9, and D1.1.10 modify the requirements where necessary to maintain consistency with the HVAC requirements in Section 7.

- Section D1.1.11 and Table D1.1 modify Table G3.1 of Appendix G of Standard 90.1 where necessary to reflect the prescriptive measures in Section 7 of this standard.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~striking through~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum j to Standard 189.1-2009

Modify the standard as follows.

Modify Section 3, Definitions, as follows:

baseline building design: see ANSI/ASHRAE/IES Standard 90.1.

baseline building performance: see ANSI/ASHRAE/IES Standard 90.1.

proposed design: see ANSI/ASHRAE/IES Standard 90.1.

proposed building performance: see ANSI/ASHRAE/IES Standard 90.1.

Modify Section 7.5 as follows:

7.5.2 Annual Energy Cost

- a. The building project shall have an annual energy cost less than or equal to that achieved by compliance with Sections 7.3 and 7.4, and Sections 5.3.2.2, 5.3.2.3, 6.3.2, 6.4.2, 8.3.1, 8.3.4, and 8.4.1. Comparisons shall be made using Normative Appendix D ~~provided that the baseline building design is calculated in accordance with the modifications and additions in Sections 7.3.1 through 7.3.3 and Sections 7.4.1 through 7.4.7, and Sections 5.3.2.2, 5.3.2.3, 6.3.2, 6.4.2, 8.3.1, 8.3.4, and 8.4.1.~~
- b. ~~Credit for daylighting controls is allowed to be taken up to a distance of 2.5 times window head height where all lighting more than one window head height from the perimeter (head height is the distance from the floor to the top of the glazing) is automatically controlled separately from lighting within one window head height of the perimeter.~~

Delete all of the existing Appendix D and replace it with the following new Appendix D:

NORMATIVE APPENDIX D **PERFORMANCE OPTION FOR** **ENERGY EFFICIENCY**

D1 GENERAL

D.1.1 Performance Option Scope. *Building projects complying with Section 7.5, the "Performance Option," shall comply with the requirements in Normative Appendix G of ANSI/ASHRAE/IES Standard 90.1 with the following modifications and additions. When a requirement is provided in this*

appendix, it supersedes the requirement in ANSI/ASHRAE/IES Standard 90.1. This appendix shall be used both for *building projects* demonstrating compliance with the requirements of this standard and for *building projects* demonstrating performance that substantially exceeds the requirements of this standard. Where stated in Normative Appendix G of ANSI/ASHRAE/IES Standard 90.1, the rating authority or program evaluator shall be the *AHJ*.

Note to Adopting Authority: ASHRAE Standing Standard Project Committee 189.1 recommends that a compliance shell implementing the rules of a compliance supplement that controls inputs to and reports outputs from the required computer analysis program be adopted for the purposes of easier use and simpler compliance.

D1.1.1 Performance Option (Section G1.2 of ANSI/ASHRAE/IES Standard 90.1). In addition to the requirements in Section G1.2 of ANSI/ASHRAE/IES Standard 90.1, all requirements in Sections 5.3, 6.3, 7.3, 8.3, and 9.3 shall be met.

D1.1.2 Trade-Off Limits (Section G1.3 of ANSI/ASHRAE/IES Standard 90.1). In addition to the requirements in Section G1.3 of ANSI/ASHRAE/IES Standard 90.1, future building components shall meet all requirements in Section 7.4.

D1.1.3 Documentation Requirements (Section G1.4 of ANSI/ASHRAE/IES Standard 90.1).

- a. In addition to the requirements in Section G1.4(d) of ANSI/ASHRAE/IES Standard 90.1, the documentation list shall include compliance with the requirements in Section 7.3.
- b. In addition to the requirements in Section G1.4(e) of ANSI/ASHRAE/IES Standard 90.1, the documentation list shall identify aspects that are less stringent than the requirements in Section 7.4.

D1.1.4 Energy Rates (Section G2.4 of ANSI/ASHRAE/IES Standard 90.1). In addition to the requirements in Section G2.4 of ANSI/ASHRAE/IES Standard 90.1, when the total modeled annual on-site renewable energy generated by the *proposed design* exceeds that generated by the *baseline building design*, the difference in the annual on-site generated renewable energy between the *baseline building performance* and the *proposed building performance* shall be based on the energy source used as the backup energy source in the *proposed design* or on the use of electricity if no backup energy source has been specified.

D1.1.5 Baseline HVAC System Type and Description (Section G3.1.1 of ANSI/ASHRAE/IES Standard 90.1). The hood or hood section modeled according to Exception (d) to Section G3.1.1 of ANSI/ASHRAE/IES Standard 90.1 shall also meet the requirements of Section 7.4.3.9.

D1.1.6 Ventilation (Section G3.1.2.6 of ANSI/ASHRAE/IES Standard 90.1).

- a. Exception (a) to Section G3.1.2.6 of ANSI/ASHRAE/IES Standard 90.1 shall be used only where *DCV* is not required by Section 7.4.3.2.
- b. Exception (c) to Section G3.1.2.6 of ANSI/ASHRAE/IES Standard 90.1 shall not apply.

D1.1.7 Economizers (Section G3.1.2.7 of ANSI/ASHRAE/IES Standard 90.1).

- a. Outdoor air economizers shall be included in the baseline systems identified in Section G3.1.2.7 of ANSI/ASHRAE/IES Standard 90.1 for the climate zones and capacities specified in Table 7.4.3.4A.
- b. Exception (a) to Section G3.1.2.7 of ANSI/ASHRAE/IES Standard 90.1 shall not apply.

D1.1.8 System Fan Power (Section G3.1.2.10 of ANSI/ASHRAE/IES Standard 90.1).

- a. System fan brake horsepower shall be 10% less than the values calculated using Table G3.1.2.9 of ANSI/ASHRAE/IES Standard 90.1.
- b. Fan motor efficiency shall meet the requirements of Section 7.4.7.1.

D1.1.9 Exhaust Air Energy Recovery (Section G3.1.2.11 of ANSI/ASHRAE/IES Standard 90.1). Exhaust air energy recovery shall be modeled in the *baseline building design* as specified in Section 7.4.3.8.

D1.1.10 VAV Minimum Flow Setpoints (Section G3.1.3.13 of ANSI/ASHRAE/IES Standard 90.1). Zone minimum airflow setpoints shall be modeled as specified in Section 7.4.3.5.

D1.1.11 Building Performance Calculations (Table G3.1 of ANSI/ASHRAE/IES Standard 90.1). In addition to Table G3.1 of ANSI/ASHRAE/IES Standard 90.1, the *baseline building design* and *proposed design* shall comply with all modifications and additions in Table D1.1. All references to "Table G3.1" in Table D1.1 refer to Table G3.1 of Appendix G of ANSI/ASHRAE/IES Standard 90.1.

**Table D1.1 Modifications and Additions to Table G3.1 of Appendix G
in ANSI/ASHRAE/IES Standard 90.1**

Proposed Building Performance	Baseline Building Performance
1. Design Model	
<u>No modifications or additions</u>	<u>No modifications or additions</u>
2. Additions and Alterations	
<u>In addition to the requirements in Table G3.1 (2.a), work to be performed in the excluded parts of the building shall comply with Sections 7.3 and 7.4.</u>	<u>No modifications or additions</u>
3. Space Use Classification	
<u>No modifications or additions</u>	<u>No modifications or additions</u>
4. Schedules	
<u>No modifications or additions</u>	<u>No modifications or additions</u>
5. Building Envelope	
<u>Exception (c) of Table G3.1 (5) shall be replaced with the following: The exterior roof surface shall be modeled using the solar reflectance and thermal emittance determined in accordance with Sections 5.3.2.3 and 5.3.2.4. Where test data are unavailable, the roof surface shall be modeled with a reflectance of 0.30 and a thermal emittance of 0.90.</u>	<ol style="list-style-type: none"> <u>In addition to the requirements in Table G3.1 (5), the <i>baseline building design</i> shall comply with Section 7.4.2.</u> <u>If the <i>proposed design</i> does not comply with Section 7.4.2.9, then the fenestration area in the <i>baseline building design</i> shall be uniformly reduced until it complies. This adjustment is not required to be made when rotating the building as required in Table G3.1 (5.a).</u> <u>In addition to the requirements in Table G3.1 (5.d and 5.e), roof surfaces shall comply with Section 5.3.2.3.</u>
6. Lighting	
<ol style="list-style-type: none"> <u>In addition to the requirements in Table G3.1 (6.c), when lighting neither exists nor is specified, lighting power shall comply with Section 7.4.6.</u> <u>When taking credit for daylight controls under Table G3.1 (6.f), credit may be taken only for lighting controls that are not required by Section 7.4.6. Credit for daylighting controls is allowed to be taken up to a distance of 2.5 times window head height where all lighting more than one window head height from the perimeter (head height is the distance from the floor to the top of the glazing) is automatically controlled separately from lighting within one window head height of the perimeter.</u> 	<u>In addition to the requirements in Table G3.1 (6), lighting power shall comply with Section 7.4.6. Automatic and manual controls shall be modeled as required in Section 7.4.6.</u>
7. Thermal Blocks—HVAC Zones Designed	
<u>No modifications or additions</u>	<u>No modifications or additions</u>
8. Thermal Blocks—HVAC Zones Not Designed	
<u>No modifications or additions</u>	<u>No modifications or additions</u>
9. Thermal Blocks—Multifamily Residential Buildings	
<u>No modifications or additions</u>	<u>No modifications or additions</u>
10. HVAC Systems	
<u>No modifications or additions</u>	<u>In addition to the requirements in Table G3.1 (10), the <i>baseline building design</i> shall comply with all requirements in Section 7.4.3.</u>

**Table D1.1 Modifications and Additions to Table G3.1 of Appendix G
in ANSI/ASHRAE/IES Standard 90.1 (Continued)**

Proposed Building Performance	Baseline Building Performance
11. Service Hot-Water Systems	
<u>In addition to the requirements in Table G3.1 (11), service hot-water usage is allowed to be lower in the <i>proposed design</i> than in the <i>baseline building design</i> if service hot-water use can be demonstrated to be less than that resulting from compliance with Sections 6.3.2, 6.4.2, and 6.4.3.</u>	<ol style="list-style-type: none"> <u>In addition to the requirements in Table G3.1 (11.b and 11.c), service hot-water systems shall meet the requirements of Sections 7.4.4, 7.4.7.2, and 7.4.7.3.</u> <u>In addition to the requirements in Table G3.1 (11.f), the <i>baseline building design</i> shall meet the requirements of Section 7.4.7.2. If a condenser heat recovery system meeting the requirements described in Section 7.4.7.2 cannot be modeled, the requirement for including such a system in the actual building shall be met as a prescriptive requirement and no heat-recovery system shall be included in the proposed or baseline building designs.</u> <u>In addition to the requirements in Table G3.1 (11.i), the <i>baseline building design</i> shall meet the requirements of Sections 6.3.2 and 6.4.3.</u>
12. Receptacle and Other Loads	
<u>No modifications or additions</u>	<u>In addition to the requirements in Table G3.1 (12), the <i>baseline building design</i> must meet the requirements in Section 7.4.7.</u>
13. Modeling Limitations to the Simulation Program	
<u>No modifications or additions</u>	<u>No modifications or additions</u>
14. Exterior Conditions	
<u>No modifications or additions</u>	<u>No modifications or additions</u>
15. Renewable Energy Systems	
<ol style="list-style-type: none"> <u>Purchase of off-site renewable energy shall not be modeled in the <i>proposed design</i>.</u> <u>The annual energy production of any <i>on-site renewable energy systems</i> in the <i>proposed design</i> shall be subtracted from the <i>proposed building performance</i>.</u> 	<u>The <i>baseline building design</i> shall have an <i>on-site renewable energy system</i> that complies with the annual energy production specified in Section 7. This annual energy production shall be subtracted from the <i>baseline building performance</i>. No exceptions shall apply.</u>

(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

This addendum modifies various portions of Section 5:

- Changes in Section 5.3.1.1 clarify greenfield site development options of Section 5.3.1.1.
- The tree growth period for the shading of hardscape in Section 5.3.1 has been modified from a five-year to a ten-year period. Ten years accounts for a wider diversity of trees across geographic regions to achieve a canopy that provides effective shading. The current requirement of five years favors fast-growing trees that may be more likely to lack stability in storms and to die at a relatively young age.

In addition, a new mandatory provision for invasive plants, with revised definitions for invasive plants, has been proposed.

Although Standard 189.1 includes a definition for “invasive plants,” the document contains no requirements pertaining to their control. Invasive plants wreak havoc on ecosystems and their control is financially burdensome to taxpayers. Therefore, changes were made to the definition to:

1. Remove the reference to “indigenous plants.” Indigenous plants cannot be invasive, per se. They may be aggressive in their role in plant succession in their local ecosystems, but that does not equate to invasiveness. Indigenous plants, by definition, cannot be “one of the great threats to biodiversity and ecosystem stability.” Rather, they have an essential role in that biodiversity and ecosystem stability.
2. Provide a consistent way for users to determine what is considered “invasive” in their regions.
3. Clarify this definition, making it more consistent with related definitions used by horticulturists and naturalists (see www.sustainablesites.org/report/Guidelines%20and%20Performance%20Benchmarks_2009.pdf).

In addition, the language for pervious areas in Section 5.4.1 has been revised in order to be in alignment with the landscape design provisions of Section 6.3.1.1. This revision is consistent with Section 6.3.1.1 (Landscape Design) in regards to promoting a percentage of the improved landscape to be biodiverse plantings other than turfgrass.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strike through~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum k to Standard 189.1-2009

Modify the standard as follows.

Modify 3.2, Definitions, as follows:

plants:

- a. **adapted plants:** plants that reliably grow well in a given habitat with minimal attention from humans in the form of winter protection, pest protection, water irrigation, or fertilization once root systems are established in the soil. Adapted plants are considered to be low maintenance but not invasive.
- b. **invasive plants:** ~~plants, both indigenous and non-indigenous species or strains, which are characteristically adaptable, aggressive, have a high reproductive capacity and tend to overrun the ecosystems that they inhabit. Collectively they are one of the great threats to biodiversity and ecosystem stability. Species of plants that are not native to the building project site and that cause or are likely to cause environmental harm. At a minimum, the list of invasive species for a building project site includes plants included in city, county, and regional lists and State and Federal Noxious Weeds laws.~~
- c. **native plants:** plants that adapted to a given area during a defined time period and are not invasive. In America, the term often refers to plants growing in a region prior to the time of settlement by people of European descent.

Modify Section 5.3.1.1 as follows:

5.3.1.1 Allowable Sites. The building project shall take place on one of the following:

- a. in an existing building envelope.
- b. on a brownfield site.
- c. on a greyfield site.
- d. on a greenfield site that is within 1/2 mi (800 m) of residential land that is developed, or that has one or more buildings is under construction, at with an average density of 10 dwelling units per acre (4 units per ha) ~~net~~ unless that site is agricultural land or forest land. Proximity is determined by drawing a circle with ~~an a~~ 1/2 mi (800 m) radius around the center of the proposed site.
- e. on a greenfield site that is within 1/2 mi (800 m) of a ~~minimum of~~ not less than ten basic services and that has pedestrian access between the building and the services unless that site is agricultural land or forest land. Basic services include, but are not limited to: financial institutions, places of worship, convenience or grocery stores, day care facilities, dry cleaners, fire stations, beauty shops, hardware stores, ~~laundromats~~ laundry facilities, libraries, medical/dental offices, senior care facilities, parks, pharmacies, post offices, restaurants, schools, supermarkets, theaters, community centers, fitness centers, museums, ~~or and~~ local government facilities. Prox-

imity is determined by drawing a circle with a 1/2 mi (800 m) radius around the center of the proposed *site*.

...

Modify Section 5.3.2.1 as follows:

5.3.2.1 Site Hardscape. For the purposes of this section, the *site hardscape* includes roads, sidewalks, courtyards, and parking lots but not the constructed building surfaces and not any portion of the *site hardscape* covered by photovoltaic panels generating electricity or other *solar energy systems* used for space heating or water heating. At least 50% of the *site hardscape* shall be provided with one or any combination of the following:

- a. existing trees and vegetation or new *bio-diverse plantings* of *native plants* and *adapted plants* located to provide shade within ~~five~~ ten years of issuance of the final certificate of occupancy. The effective shade coverage on the *hardscape* shall be the arithmetic mean of the shade coverage calculated at 10 a.m., noon, and 3 p.m. on the summer solstice.
- b. paving materials with a minimum initial *SRI* of 29. This also applies to *porous pavers (open-grid pavers)* and *open-graded (uniform-sized) aggregate* materials. A default *SRI* value of 35 for new concrete without added color pigment is allowed to be used instead of measurements.
- c. shading through the use of structures, provided that the top surface of the shading structure complies with the provisions of Section 5.3.2.3.
- d. parking under a building, provided that the *roof* of the building complies with the provisions of Section 5.3.2.3.
- e. buildings or structures that provide shade to the *site hardscape*. The effective shade coverage on the *hardscape* shall be the arithmetic mean of the shade coverage calculated at 10 a.m., noon, and 3 p.m. on the summer solstice.

Exception: Section 5.3.2.1 shall not apply to building projects in climate zones 6, 7, and 8.

Add a new mandatory requirement in Section 5.3 as follows:

5.3.4 Plants

5.3.4.1 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.*

Modify Section 5.4.1 as follows:

5.4.1.1 Effective Pervious Area for All Sites. A minimum of 40% of the entire *site* shall incorporate one or any combination of the following:

- a. shall be vegetated with a minimum depth of growing medium of 12 in. (300 mm). Such vegetated areas include bioretention facilities, rain gardens, filter strips, grass swales, vegetated level spreaders, constructed *wetlands*, planters, ~~or~~ and open space with plantings. At least 60% of the vegetated area shall consist of *biodiverse planting* of *native plants* and/or adapted plants other than turf-grass.

...

5.4.1.2 Greenfield Sites. On a *greenfield site*:

- a. 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. 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, ~~or~~ and open space with plantings. A minimum of 60% of such vegetated area shall consist of *biodiverse planting* of *native plants* and/or adapted plants other than turf-grass.

Exceptions to Section 5.4.1.2(b): Locations with less than 10 in. (250 mm) of average annual rainfall.

(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

This addendum adds a mandatory requirement in Section 5.3.

Vehicles negatively impact the environment through the generation of air pollution, traffic congestion, and issues associated with oil extraction and petroleum refining. The use of alternative modes of transportation helps reduce the energy demand for transportation and associated greenhouse gas emissions. Pedestrian mobility is the foundation of any multimodal travel environment. All pedestrian-friendly environments help drive transit use and support bicycle mobility. Designated walkways provide easy accessibility and reduce the likelihood of pedestrian-automobile collisions. Pedestrian connectivity supports the health benefits of physical exercise by making it convenient to meet daily needs by walking. Pedestrian-friendly access is also inclusionary by allowing individuals without vehicles to easily meet their daily needs.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~striketrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum o to Standard 189.1-2009

Modify the standard as follows.

Add a new mandatory requirement in Section 5.3 as follows:

5.3.5 Mitigation of Transportation Impacts

5.3.5.1 Pedestrian and Transit Connectivity

5.3.5.1.1 Walkways. A pedestrian walkway shall be provided that connects a public way or transit stop to primary building entrances. Walkways across parking lots shall be clearly delineated.

Add a definition to Section 3 as follows:

public way: A street, alley, transit right of way, or other parcel of land open to the outdoors leading to a street or transit right of way that has been deeded, dedicated, or otherwise permanently appropriated to the public for public use and that has a clear width and height of not less than 10 ft (3 m).

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the standards and guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive technical committee structure, continue to generate up-to-date standards and guidelines where appropriate and adopt, recommend, and promote those new and revised standards developed by other responsible organizations.

Through its Handbook, appropriate chapters will contain up-to-date standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating standards and guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

