ADDENDA

ANSI/ASHRAE/IES Addendum o to
ANSI/ASHRAE/IES Standard 90.1-2019

Energy Standard for Buildings Except Low-Rise Residential Buildings

Approved by ASHRAE and the American National Standards Institute on July 30, 2021, and by the Illuminating Engineering Society on June 9, 2021.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (https://www.ashrae.org/continuous-maintenance).

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SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus Standard developed under the auspices of ASHRAE. *Consensus* is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this Standard as an ANS, as "substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution." Compliance with this Standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

The Senior Manager of Standards of ASHRAE should be contacted for

a. interpretation of the contents of this Standard,
b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
d. permission to reprint portions of the Standard.

(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

Addendum o reduces the minimum connected load for daylighting responsive controls for sidelighting (Section 9.4.1.1[e]) and toplighting (Section 9.4.1.1[f]). In 2013, the standard was amended to establish a wattage threshold. If the connected load in the daylighted area is less than this minimum threshold, daylight responsive lighting controls are not required. The primary sidelighted area minimum wattage is 150 W, and the primary and secondary sidelighted areas is 300 W. Similarly, the minimum wattage for toplighted spaces is also set at 150 W.

A study found that, due to the shift to LED lights, most spaces no longer have connected load in the daylighted zones that would require daylight responsive controls. An analysis was conducted to determine a wattage threshold that is both cost effective and feasible for most spaces.

Costs have shifted since 2013. In 2013, the fluorescent system needed either a dimming ballast or multiple ballasts, adding between $30 and $100 per fixture adder. Dimming drivers are a standard no-cost feature of LED equipment. Other costs have changed since 2013 because of the advent of sensors that are integral to the fixtures.

Table 9.6.1 details the allowed lighting power density as well as control requirements for each space. Daylight responsive controls are potentially required for 89 space types (84 spaces for toplighting, 89 spaces for sidelighting, and virtually all overlap). This addendum does not change any of the space types that may or may not be required to consider daylight responsive controls. Note, retail spaces are addressed in Table 9.6.1. This addendum removes Exception 3 in 9.4.1.1(e) where retail spaces are mentioned, because these spaces are addressed in the table.

Energy Savings:

- *This addendum maintains energy saving requirements established in 2013.*

Cost Effectiveness:

- *This addendum meets the scalar threshold prescribed by Standard 90.1 practices. This addendum assumed a 15-year device life (same life used in the previous analysis) using the standard blended rate.*

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

Addendum o to Standard 90.1-2019

Modify the standard as shown (I-P and SI units).

9.4.1.1 Interior Lighting Controls.

[. . .]

e. *Automatic daylight responsive controls for sidelighting:* In any *space* where the combined input power of all *general lighting* completely or partially within the *primary sidelighted* areas is 75 ~~150~~ W or greater, the *general lighting* in the *primary sidelighted* areas shall be controlled by photocontrols

In any *space* where the combined input power of all *general lighting* completely or partially within the *primary sidelighted area* and *secondary sidelighted area* is 150 ~~300~~ W or greater, the *general lighting* in the *primary sidelighted area* and *secondary sidelighted area* shall be controlled by photocontrols. *General lighting* in the *secondary sidelighted area* shall be controlled independently of the general lighting in the *primary sidelighted area*.

The *control system* shall have the following characteristics:

1. The calibration adjustment *control* shall be located no higher than 11 ft above the finished *floor*. Calibration shall not require the physical presence of a person at the sensor while it is processing.

2. The photocontrol shall reduce electric lighting power in response to available daylight using continuous dimming to 20% or less and off.
3. When an automatic partial OFF control has reduced the lighting power to the unoccupied *set point* in accordance with Section 9.4.1(g), the daylight responsive control shall adjust the electric light in response to available daylight, but it shall not allow the lighting power to be above the unoccupied *set point*.

Exception to 9.4.1.1(e): The following areas are exempted from Section 9.4.1.1(e):

1. *Primary sidelighted areas* where the top of any existing adjacent structure or natural object is at least twice as high above the windows as its horizontal distance away from the windows.
2. Sidelighted areas where the total glazing area is less than 20 ft^2.
3. ~~Retail *spaces*.~~
4. ~~4.~~ *Primary sidelighted areas* adjacent to *vertical fenestration* that have external projections and no *vertical fenestration* above the external projection, where the external projection has a *projection factor* greater than 1.0 for *north-oriented* projections or where the external projection has a *projection factor* greater than 1.5 for all other orientations (see Figure 3.2-6).

f. Automatic daylight responsive controls for toplighting: In any space where the combined input power for all general lighting completely or partially within daylight area under skylights and daylight area under roof monitors is 75 ~~150~~ W or greater, general lighting in the daylight area shall be controlled by photocontrols. The control system shall have the following characteristics:

1. The calibration adjustment *control* shall be located no higher than 11 ft above the finished *floor*. Calibration shall not require the physical presence of a person at the sensor while it is processing.
2. The photocontrol shall reduce electric lighting power in response to available daylight using continuous dimming to 20% or less and off.
3. When an *automatic* partial OFF control has reduced the lighting power to the unoccupied *set point* in accordance with Section 9.4.1(g), the daylight responsive control shall adjust the electric light in response to available daylight, but it shall not allow the lighting power to be above the unoccupied *set point*.
4. *General lighting* in overlapping toplighted and sidelighted *daylight areas* shall be controlled together with *general lighting* in the *daylight area under skylights* or *daylight area under roof monitors*.

Exceptions to 9.4.1.1(f): The following areas are exempted from Section 9.4.1.1 (f):

1. *Daylight area under skylights* where it is documented that existing adjacent structures or natural objects block direct sunlight for more than 1500 daytime hours per year between 8 a.m. and 4 p.m.
2. *Daylight area under skylights* where the overall *skylight effective aperture* for the *enclosed space* is less than 0.006.
3. In each space within buildings in Climate Zone 8 where the input power of the general lighting within daylight areas is less than 200 W.

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.

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As an industry leader in research, standards writing, publishing, certification, and continuing education, ASHRAE and its members are dedicated to promoting a healthy and sustainable built environment for all, through strategic partnerships with organizations in the HVAC&R community and across related industries.

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