ADDENDA

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

Energy Standard for Buildings Except Low-Rise Residential Buildings

Approved by the ASHRAE Standards Committee on June 25, 2022; by the ASHRAE Board of Directors on June 29, 2022; by the Illuminating Engineering Society on June 17, 2022; and by the American National Standards Institute on July 29, 2022.

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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FOREWORD

Addendum ac updates the exceptions to interior lighting power and minimum control requirements found in Table 9.2.3.1 and includes a power exception for the germicidal function in luminaires and sources (sometimes referred to as "germicidal lighting" or "germicidal ultra-violet irradiation" [GUVI]). The COVID-19 pandemic has brought germicidal function for room air and room surface disinfection into the forefront as a viable, effective strategy for protecting people and keeping interior environments healthy. The power exception of the germicidal function for disinfection from Standard 90.1-2016 was confirmed by Interpretation IC 90.1-2016-8 OF approved in January 2019. Adding the power exception for germicidal function to Table 9.2.3.1 supports the official interpretation.

Some changes clarify the exception language to improve application, and better differentiate lighting that must follow the lighting power and control requirements. The exception for lighting used in photographic processes, intended for photographic development darkrooms, was eliminated due to the limited instances of this space type and confusion in the application.

Where the allowed lighting power density allowance and control requirements can be determined for a specific lighting application, including it in the standard, and not excepting it, delivers consistent energy efficient implementation. This was accomplished for two lighting power applications, the prior Table 9.2.3.1 item nine for casino gaming areas and the prior Table 9.2.3.1 item 18 for parking garage daylight transition zone lighting. Both of these lighting applications were removed from the exceptions table, and lighting power density values and control requirements were added to Table 9.6.1. Particularly in the creation of the casino gaming area lighting power density, considerable effort was taken to establish values to support the design variability and flexibility needed for these spaces. These new baseline lighting power density values take into account the additional lighting power for the purpose of decorative appearance, remaining available for use through Section 9.6.2, "Additional Interior Lighting Power."

A new lighting power density value is added to Table 9.6.1 for parking garage daylight transition zone lighting. The addendum also updates the lighting power density value for parking garage lighting because of review of the model, lighting efficacy improvements, and the relationship between these two values in a parking garage area. A definition for "parking garage daylight transition zone" aligned with IES recommended practice was also added to support this new requirement.

Energy savings is anticipated with this addendum resulting from improved compliance due to clearer language and the removal of several applications from exempted power status. These changes do not increase in the cost of construction.

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 ac to Standard 90.1-2019

Modify Section 3.2 as shown (I-P and SI).

3.2 Definitions

[. . .]

parking garage daylight transition zone: covered vehicle entrances and exits from *buildings* and parking structures not exceeding a depth of 66 ft (20 m) inside the structure, or a depth as determined by ANSI/IES RP-8, and not exceeding a width of 30 ft (9.1 m) to either side of the drive aisle centerline and not extending beyond adjacent walls.

[. . .]

Modify Section 9 as shown (I-P and SI).

9.4.1.2 Parking Garage Lighting Control. Lighting for parking garages shall comply with the following requirements:

Table 9.2.3.1 Exceptions to Interior Lighting Power and Minimum Control Requirements

Item #	Equipment/Application	In Addition to and Controlled Separately from *General Lighting*	Required Controls
1	Lighting that is integral to *equipment*, medical *equipment* or instrumentation, and is installed by its *manufacturer*	YES	No control requirements
2	Power for only the germicidal function in luminaires or sources	YES	No control requirements
~~2~~3	Lighting specifically designed for use only during medical or dental procedures	YES	9.4.1.1(a)—Local control
~~3~~4	Lighting specifically designed for the life support of non-human life forms	YES	9.4.1.1(a)—Local control
~~4~~5	Lighting for ~~theatrical purposes, including performance, stage,~~ video broadcasting~~, broadcast studio, and~~ video or film ~~and video~~ production, or live performance	YES	9.4.1.1(a)—Local control
~~5~~	~~Lighting in sporting activity areas for television broadcasting~~	~~YES~~	~~9.4.1.1(a) Local control~~
~~6~~	~~Lighting for photographic processes~~	~~YES~~	~~9.4.1.1(a) Local control~~
~~7~~6	Lighting that is an integral part of advertising or directional signage	YES	9.4.1.1(i)—Scheduled shutoff
~~8~~7	Lighting integral to both open and glass-enclosed refrigerator and freezer cases	YES	9.4.1.1(h)—Automatic full OFF or 9.4.1.1(i)—Scheduled shutoff
~~9~~	~~Casino gaming areas~~	~~NO~~	~~9.4.1.1(h) Automatic full OFF~~ ~~or~~ ~~9.4.1.1(i) Scheduled shutoff~~
~~10~~8	Lighting in retail display windows, provided the display area is enclosed by ceiling-height partitions	YES	9.4.1.1(a)—Local control and 9.4.1.1(i)—Scheduled shutoff
~~11~~9	Display or accent lighting that is an essential element for the function performed in galleries, museums, and monuments	YES	9.4.1.1(a)—Local control and either 9.4.1.1(h)—Automatic full OFF or 9.4.1.1(i)—Scheduled shutoff
~~12~~10	Lighting integral to food warming and food preparation equipment	YES	9.4.1.1(a)—Local control and either 9.4.1.1(h)—Automatic full OFF or 9.4.1.1(i)—Scheduled shutoff
~~13~~11	Lighting that is for sale or lighting educational demonstration systems	YES	9.4.1.1(a)—Local control and either 9.4.1.1(h)—Automatic full OFF or 9.4.1.1(i)—Scheduled shutoff
~~14~~12	Mirror lighting in makeup or dressing ~~rooms~~ areas used for theatrical or broadcast functions	YES	9.4.1.1(a)—Local control and either 9.4.1.1(h)—Automatic full OFF or 9.4.1.1(i)—Scheduled shutoff
~~15~~13	Accent lighting in religious pulpit and choir areas	YES	9.4.1.1(a)—Local control and either 9.4.1.1(h)—Automatic full OFF or 9.4.1.1(i)—Scheduled shutoff
~~16~~14	Lighting in interior *spaces* that have been specifically designated as a registered interior *historic* landmark	NO	9.4.1.1(a)—Local control and either 9.4.1.1(h)—Automatic full OFF or 9.4.1.1(i)—Scheduled shutoff

Table 9.2.3.1 Exceptions to Interior Lighting Power and Minimum Control Requirements

Item #	Equipment/Application	In Addition to and Controlled Separately from *General Lighting*	Required Controls
~~17~~15	Furniture-mounted supplemental *task lighting*	YES	~~9.4.1.3(e) Special Applications~~ 9.4.1(a)—Local control and 9.4.1.1(h)—Automatic full OFF
~~18~~	~~Parking garage daylight transition lighting lighting for covered vehicle entrances and exits from *buildings* and parking structures; each transition zone shall not exceed a depth of 66 ft inside the structure and a width of 50 ft.~~	~~YES~~	~~9.4.1.2(a) and (e) Parking Garage Control~~

a. Parking garage lighting shall have *automatic* lighting shutoff per Section 9.4.1.1(i).
b. Lighting power of each *luminaire* shall be *automatically* reduced by a minimum of 50% when there is no activity detected within a lighting zone for 10 minutes. Lighting zones for this requirement shall be no larger than 3600 ft^2 (334 m^2).
c. ~~Parking garage daylight transition~~*Parking garage daylight transition zone* lighting ~~exempt per Section 9.2.3.1~~ shall be separately controlled to *automatically* reduce the lighting to no more than the general light level ~~at night~~ from sunset to sunrise.
d. The power to any *luminaire* within 20 ft (6 m) of perimeter *wall* openings totaling at least 24 ft^2 (2.2 m^2) shall be *automatically* reduced through *continuous dimming* in response to available daylight.

Exceptions to 9.4.1.2(d):

1. ~~Parking garage daylight transition~~*Parking garage daylight transition zone* lighting ~~exempt per Section 9.2.3.1~~.
2. Where permanent screens or architectural elements obstruct more than 50% of the opening.
3. Where the top of any existing adjacent structure or natural object is at least twice as high above the openings as its horizontal distance from the opening.

Table 9.6.1 *Lighting Power Density* Allowances Using the Space-by-Space Method and Minimum *Control* Requirements Using Either Method

Informative Note: This table is divided into two sections; this first section covers *space* types that can be commonly found in multiple *building* types. The second part of this table covers *space* types that are typically found in a single *building* type.			The *control* functions below shall be implemented in accordance with the descriptions found in the referenced paragraphs within Section 9.4.1.1. For each *space* type: • All REQs shall be implemented. • At least one ADD1 (when present) shall be implemented. • At least one ADD2 (when present) shall be implemented.								
			Local *Control* (See Section 9.4.1.1[a])	Restricted to *Manual* ON (See Section 9.4.1.1[b])	Restricted to Partial *Automatic* ON (See Section 9.4.1.1[c])	Bilevel Lighting *Control* (See Section 9.4.1.1[d])	*Automatic* Daylight Responsive *Controls* for Sidelighting (See Section 9.4.1.1[e][6])	*Automatic* Daylight Responsive *Controls* for *Toplighting* (See Section 9.4.1.1[f][6])	*Automatic* Partial OFF (See Section 9.4.1.1[g] [Full Off complies])	*Automatic* Full OFF (See Section 9.4.1.1[h])	Scheduled Shutoff (See Section 9.4.1.1[i])
Common *Space* Types[1]	**LPD, W/ft^2 (W/m^2)**	***RCR* Threshold**	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**
[. . .]											
~~Parking Area, Interior~~	~~0.15 (1.6)~~	~~4~~	~~See Section 9.4.1.2~~								
Parking Garage											
Daylight transition zone	1.06 (11.4)	4	See Section 9.4.1.2.								
All other parking and drive areas	0.11 (1.2)	4	See Section 9.4.1.2.								
[. . .]											
Building Type Specific/Space Types[1]	**LPD, W/ft^2 (W/m^2)**	***RCR* Threshold**	**a**	**b**	**c**	**d**	**e**	**f**	**g**	**h**	**i**
[. . .]											
Automotive (See “Vehicular Maintenance Area”)											
Casino—Gaming Area											
Betting/sportsbook/keno/bingo area	0.82 (8.8)	5								ADD2	ADD2
High-limit game area	1.68 (18.1)	4								ADD2	ADD2
Slot machine/digital gaming area	0.54 (5.8)	5								ADD2	ADD2
Table games area	1.09 (11.7)	5								ADD2	ADD2
[. . .]											

Add new informative reference to Appendix E as shown (I-P and SI).

Subsection No.	Reference	Title/Source
[. . .]		
3.2	IES RP-8-18	Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting
[. . .]		

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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.

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