ANSI/ASHRAE/ICC/USGBC/IES Addendum as to ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2017

Standard for the Design of High-Performance Green Buildings

Except Low-Rise Residential Buildings

The Complete Technical Content of the International Green Construction Code®

Approved by ASHRAE and the American National Standards Institute on July 6, 2020; by the International Code Council on June 1, 2020; by the U.S. Green Building Council on June 3, 2020; and by the Illuminating Engineering Society on July 1, 2020.

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FOREWORD

Addendum as updates those LPDs that are greater than 91% of the ASHRAE Standard 90.1-2019 LPDs for most applications. The 91% LPD adjustment value for most of the Standard 189.1 changes because the Standard 90.1-2019 LPDs are based on providing 110% of the maintained light output as recommended by the Illuminating Engineering Society (IES) standards after applying all the other light loss factors, whereas this proposal would be based on meeting the IES recommended illuminances in the Recommended Practices (RPs) and the IES Handbook as selected by the Standard 90.1 subcommittee.

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 as to Standard 189.1-2017

Revise Tables 7.4.6.1A and table 7.4.6.1B as shown (I-P and SI units).

Table 7.4.6.1A Lighting Power Densities Using the Building Area Method

Building Area Type[a]	LPD, W/ft^2	LPD, W/m^2
Automotive facility	0.64	6.9
Convention center	0.51	5.5
Courthouse	0.74	8.0
Dining: Bar lounge/leisure	0.69	7.4
Dining: Cafeteria/fast food	0.66	7.1
Dining: Family	0.61	6.6
Dormitory	~~0.52~~0.48	~~5.6~~5.2
Exercise center	0.61	6.6
Fire station	0.50	5.4
Gymnasium	0.67	7.2
Health care clinic	0.68	7.3
Hospital	0.86	9.3
Hotel/motel	~~0.70~~0.56	~~7.5~~6.0
Library	0.72	7.8
Manufacturing facility	0.60	6.5
Motion picture theater	~~0.62~~0.44	~~6.7~~4.7
Multifamily	~~0.49~~0.45	~~5.3~~4.8
Museum	~~0.68~~0.50	~~7.3~~5.4
Office	~~0.69~~0.60	~~7.4~~6.5
Parking garage	0.12	1.3
Penitentiary	0.67	7.2
Performing arts theater	~~0.85~~0.76	~~9.1~~8.2
Police station	0.68	7.3
Post office	0.62	6.7
Religious facility	0.70	7.5
Retail	~~0.91~~0.84	~~9.8~~9.0
School/university	0.67	7.2
Sports arena	~~0.76~~0.69	~~8.2~~7.4
Town hall	~~0.72~~0.63	~~7.8~~6.8
Transportation	~~0.51~~0.45	~~5.5~~4.9
Warehouse	0.41	4.4
Workshop	0.83	8.9

a. In cases where both a general building area type and a specific building area type are listed, the specific building area type shall apply.

Table 7.4.6.1B Lighting Power Density (LPD) Allowances and Room Cavity Ratio (RCR) Thresholds Using the Space-by-Space Method

Informative Note: This table is divided into two sections. The first section covers *space* types that can be commonly found in multiple-building types. The second part covers *space* types that are typically found in a single-building type.

Common Space Types [a]	LPD, W/ft^2	LPD, W/m^2	RCR Threshold
Atrium			
<20 ft (6.1 m) in height	~~0.023/ft total height~~0.39	~~0.81/m total height~~4.2	NA
≥20 ft (6.1m) and ≤40 ft (12.2 m) in height	~~0.023/ft total height~~0.48	~~0.81/m total height~~5.2	NA
>40 ft (12.2 m) in height	~~0.30 + 0.015/ft total height~~0.60	~~3.2 + 0.53/m total height~~6.5	NA
Audience Seating Area			
Auditorium	~~0.67~~0.44	~~7.2~~4.7	6
Convention center	~~0.65~~0.23	~~7.0~~2.5	4
Gymnasium	~~0.43~~0.23	~~4.6~~2.5	6
Motion picture theater	~~0.64~~0.30	~~6.9~~3.2	4
Penitentiary	0.44	4.7	4
Performing arts theater	~~1.34~~0.75	~~14.4~~8.1	8
Religious building	~~0.98~~0.65	~~10.5~~7.0	4
Sports arena	~~0.42~~0.30	~~4.5~~3.2	4
All other audience *seating* areas	~~0.40~~0.23	~~4.3~~2.5	4
Banking Activity Area	~~0.79~~0.55	~~8.5~~6.0	6
Breakroom (See Lounge/Breakroom)			
Classroom/Lecture Hall/Training Room			
Penitentiary	~~1.06~~0.81	~~11.4~~8.7	4
All other *classrooms*/lecture halls/training rooms	~~0.74~~0.65	~~8.0~~6.9	4
Conference/Meeting/Multipurpose Room	~~0.93~~0.88	~~10.0~~9.5	6
Confinement Cells	0.52	5.6	6
Copy/Print Room	~~0.50~~0.31	~~5.4~~3.3	6
Corridor [b]			
Facility for the visually impaired (and not used primarily by the staff) [c]	~~0.81~~0.71	~~8.7~~7.6	width < 8 ft (2.4 m)
Hospital	~~0.81~~0.65	~~8.7~~6.9	width < 8 ft (2.4 m)
Manufacturing facility	0.28	3.0	width < 8 ft (2.4 m)
All other corridors	~~0.58~~0.37	~~6.2~~4.0	width < 8 ft (2.4 m)
Courtroom	0.98	10.5	6
Computer Room	~~1.16~~0.85	~~12.5~~9.2	4
Dining Area			
Penitentiary	~~0.72~~0.42	~~7.8~~4.5	6
Facility for the visually impaired (and not used primarily by staff) [c]	~~1.48~~1.27	~~15.9~~13.7	4

a. In cases where both a common *space* type and a building area specific *space* type are listed, the building area specific *space* type shall apply
b. In corridors, the extra LPD allowance is permitted when the width of the corridor is less than 8 ft (2.4 m) and is not based on the RCR, see Section 7.4.6.1.1(c).
c. A "Facility for the visually impaired" is a facility that can be documented as being designed to comply with the light levels in ANSI/IES RP-28 and is licensed or will be licensed by local/state authorities for either senior long-term care, adult daycare, senior support, and/or people with special visual needs.
d. For accent lighting, see Section 7.4.6.1.1(d)
e. Sometimes referred to as a "picking area."
f. Not used to keep footnote numbering consistent with ANSI/ASHRAE/IES Standard 90.1.
g. Electrical/mechanical rooms. An additional 0.50 W/ft^2 (5.4 W/m^2) shall be allowed, provided that the additional lighting is controlled separately from the base allowance of 0.39 W/ft^2 (4.2 W/m^2). The additional 0.50 W/ft^2 (5.4 W/m^2) allowance shall not be used for any other purpose.
h. Class of play as defined by IES RP-6.

Table 7.4.6.1B Lighting Power Density (LPD) Allowances and Room Cavity Ratio (RCR) Thresholds Using the Space-by-Space Method

Informative Note: This table is divided into two sections. The first section covers *space* types that can be commonly found in multiple-building types. The second part covers *space* types that are typically found in a single-building type.

Common Space Types [a]	LPD, W/ft^2	LPD, W/m^2	RCR Threshold
Bar/lounge or leisure dining	0.62	6.7	4
Cafeteria or fast food dining	~~0.53~~0.36	~~5.7~~3.9	4
Family dining	0.54	5.8	4
All other dining areas	~~0.53~~0.39	~~5.7~~4.2	4
Electrical/Mechanical Room [g]	0.39	4.2	6
Emergency Vehicle Garage	~~0.53~~0.47	~~5.7~~5.1	4
Food Preparation Area	0.92	9.9	6
Guest Room	~~0.75~~0.41	~~8.1~~4.4	6
Laboratory			
In or as a *classroom*	1.04	11.2	6
All other laboratories	1.24	13.3	6
Laundry/Washing Area	0.43	4.6	4
Loading Dock, Interior	0.51	5.5	6
Lobby			
Facility for the visually impaired (and not used primarily by the staff) [c]	1.30	14.0	4
Elevator	0.52	5.6	6
Hotel	~~0.68~~0.46	~~7.3~~5.0	4
Motion picture theater	~~0.38~~0.30	~~4.1~~3.2	4
Performing arts theater	0.82	8.8	6
All other lobbies	~~0.86~~0.76	~~9.3~~8.2	4
Locker Room	0.45	4.8	6
Lounge/Breakroom			
Healthcare facility	~~0.53~~0.38	~~5.7~~4.1	6
All other lounges/breakrooms	0.44	4.7	4
Office			
Enclosed and ≤250 ft^2 (23 m^2)	~~0.85~~0.67	~~9.1~~7.2	8
Enclosed and >250 ft^2 (23 m^2)	~~0.85~~0.60	~~9.1~~6.5	8
Open plan	~~0.78~~0.55	~~8.4~~6.0	4
Parking Area, Interior	0.11	1.2	4
Pharmacy Area	1.23	13.2	6
Restroom			
Facility for the visually impaired (and not used primarily by the staff) [c]	0.81	8.7	8
All other restrooms	~~0.75~~0.57	~~8.1~~6.2	8

a. In cases where both a common *space* type and a building area specific *space* type are listed, the building area specific *space* type shall apply
b. In corridors, the extra LPD allowance is permitted when the width of the corridor is less than 8 ft (2.4 m) and is not based on the RCR, see Section 7.4.6.1.1(c).
c. A "Facility for the visually impaired" is a facility that can be documented as being designed to comply with the light levels in ANSI/IES RP-28 and is licensed or will be licensed by local/state authorities for either senior long-term care, adult daycare, senior support, and/or people with special visual needs.
d. For accent lighting, see Section 7.4.6.1.1(d)
e. Sometimes referred to as a "picking area."
f. Not used to keep footnote numbering consistent with ANSI/ASHRAE/IES Standard 90.1.
g. Electrical/mechanical rooms. An additional 0.50 W/ft^2 (5.4 W/m^2) shall be allowed, provided that the additional lighting is controlled separately from the base allowance of 0.39 W/ft^2 (4.2 W/m^2). The additional 0.50 W/ft^2 (5.4 W/m^2) allowance shall not be used for any other purpose.
h. Class of play as defined by IES RP-6.

Table 7.4.6.1B Lighting Power Density (LPD) Allowances and Room Cavity Ratio (RCR) Thresholds Using the Space-by-Space Method

Informative Note: This table is divided into two sections. The first section covers *space* types that can be commonly found in multiple-building types. The second part covers *space* types that are typically found in a single-building type.

Common Space Types [a]	LPD, W/ft^2	LPD, W/m^2	RCR Threshold
Sales Area [d]	~~1.06~~0.95	~~11.4~~10.3	6
Seating Area, General	~~0.38~~0.23	~~4.1~~2.5	4
Stairway	The *space* containing the stairway shall determine the LPD requirements for the stairway.		
Stairwell	~~0.50~~0.45	~~5.4~~4.8	10
Storage Room			
<50 ft^2 (4.6m^2)	~~0.86~~0.51	~~9.3~~5.5	6
≥50 ft^2 (4.6m^2) and ≤ 1000 ft^2 (93 m^2)	~~0.43~~0.35	~~4.6~~3.7	6
All other storage rooms	~~0.43~~0.35	~~4.6~~3.7	6
Vehicular Maintenance Area	0.53	5.7	4
Workshop	1.09	11.7	6

Building Type Specific Space Types [a]	LPD, W/ft^2	LPD, W/m^2	RCR Threshold
Facility for the Visually Impaired [c]			
Chapel (used primarily by residents)	~~0.89~~0.70	~~8.9~~7.5	4
Recreation room/common living room (and not used primarily by staff)	1.53	15.3	6
Automotive (See "Vehicular Maintenance Area")			
Convention Center—Exhibit Space	~~0.69~~0.55	~~7.43~~6.0	4
Dormitory—Living Quarters	0.46	4.95	8
Fire Station—Sleeping Quarters	0.19	2.05	6
Gymnasium/Fitness Center			
Exercise area	0.50	5.4	4
Playing area	0.75	8.1	4
Healthcare Facility			
Exam/treatment room	1.16	12.5	8
Imaging room	~~0.98~~0.85	~~10.5~~9.2	6
Medical supply room	0.54	5.8	6
Nursery	0.94	10.1	6
Nurse's station	0.75	8.1	6
Operating room	1.87	20.1	6
Patient room	0.45	4.8	6
Physical therapy room	0.85	9.1	6
Recovery room	0.89	9.6	6

a. In cases where both a common *space* type and a building area specific *space* type are listed, the building area specific *space* type shall apply

b. In corridors, the extra LPD allowance is permitted when the width of the corridor is less than 8 ft (2.4 m) and is not based on the RCR, see Section 7.4.6.1.1(c).

c. A "Facility for the visually impaired" is a facility that can be documented as being designed to comply with the light levels in ANSI/IES RP-28 and is licensed or will be licensed by local/state authorities for either senior long-term care, adult daycare, senior support, and/or people with special visual needs.

d. For accent lighting, see Section 7.4.6.1.1(d)

e. Sometimes referred to as a "picking area."

f. Not used to keep footnote numbering consistent with ANSI/ASHRAE/IES Standard 90.1.

g. Electrical/mechanical rooms. An additional 0.50 W/ft^2 (5.4 W/m^2) shall be allowed, provided that the additional lighting is controlled separately from the base allowance of 0.39 W/ft^2 (4.2 W/m^2). The additional 0.50 W/ft^2 (5.4 W/m^2) allowance shall not be used for any other purpose.

h. Class of play as defined by IES RP-6.

Table 7.4.6.1B Lighting Power Density (LPD) Allowances and Room Cavity Ratio (RCR) Thresholds Using the Space-by-Space Method

Informative Note: This table is divided into two sections. The first section covers *space* types that can be commonly found in multiple-building types. The second part covers *space* types that are typically found in a single-building type.

Building Type Specific Space Types [a]	LPD, W/ft^2	LPD, W/m^2	RCR Threshold
Library			
Reading area	0.77	8.3	4
Stacks	1.08	11.6	4
Manufacturing Facility			
Detailed manufacturing area	~~0.86~~0.80	~~9.3~~8.6	4
Equipment room	0.61	6.6	6
Extra high bay area (>50 ft [15.2 m] floor-to-ceiling height)	0.73	7.9	4
High bay area (25 ft [7.6 m] to 50 ft [15.2 m] floor-to-ceiling height)	0.58	6.2	4
Low bay area (<25 ft [7.6 m] floor-to-ceiling height)	0.61	6.6	4
Museum			
General exhibition area	~~0.61~~0.31	~~6.6~~3.3	6
Restoration room	0.77	8.3	6
Performing Arts Theater—Dressing Room	0.35	3.8	6
Post Office—Sorting Area	0.66	7.1	4
Religious Buildings			
Fellowship hall	0.42	4.5	4
Worship/pulpit/choir area	~~0.98~~0.77	~~10.5~~8.3	4
Retail Facilities			
Dressing/fitting room	0.49	5.3	8
Mall concourse	~~0.79~~0.53	~~8.5~~5.7	4
Sports Arena—Playing Area [h]			
Class I facility	2.26	24.3	4
Class II facility	1.45	15.6	4
Class III facility	1.08	11.6	4
Class IV facility	0.72	7.8	4
Transportation Facility			
Baggage/carousel area	~~0.40~~0.35	~~4.3~~3.8	4
Airport concourse	0.22	2.4	4
Terminal ticket counter	0.48	5.2	4
Warehouse—Storage Area			
Medium-to-bulky, palletized items	0.27	2.9	4
Smaller, hand-carried items [e]	~~0.65~~0.60	~~7.0~~6.5	6

a. In cases where both a common *space* type and a building area specific *space* type are listed, the building area specific *space* type shall apply
b. In corridors, the extra LPD allowance is permitted when the width of the corridor is less than 8 ft (2.4 m) and is not based on the RCR, see Section 7.4.6.1.1(c).
c. A "Facility for the visually impaired" is a facility that can be documented as being designed to comply with the light levels in ANSI/IES RP-28 and is licensed or will be licensed by local/state authorities for either senior long-term care, adult daycare, senior support, and/or people with special visual needs.
d. For accent lighting, see Section 7.4.6.1.1(d)
e. Sometimes referred to as a "picking area."
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g. Electrical/mechanical rooms. An additional 0.50 W/ft^2 (5.4 W/m^2) shall be allowed, provided that the additional lighting is controlled separately from the base allowance of 0.39 W/ft^2 (4.2 W/m^2). The additional 0.50 W/ft^2 (5.4 W/m^2) allowance shall not be used for any other purpose.
h. Class of play as defined by IES RP-6.

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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Standard 189.1 and the International Green Construction Code

Standard 189.1 serves as the complete technical content of the International Green Construction Code® (IgCC). The IgCC creates a regulatory framework for new and existing buildings, establishing minimum green requirements for buildings and complementing voluntary rating systems. For more information, visit www.iccsafe.org.

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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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