ADDENDA

ANSI/ASHRAE/IES Addendum ch to
ANSI/ASHRAE/IES Standard 90.1-2013

Energy Standard for Buildings Except Low-Rise Residential Buildings

Approved by the ASHRAE Standards Committee on August 24, 2016; by the ASHRAE Board of Directors on Septebmer 6, 2016; by the IES Board of Directors on September 26, 2016; and by the American National Standards Institute on September 28, 2016.

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. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE website (www.ashrae.org) or in paper form from the Senior Manager of Standards.

The latest edition of an ASHRAE Standard may be purchased on the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

© 2016 ASHRAE ISSN 1041-2336

ASHRAE® IES Illuminating ENGINEERING SOCIETY Approved American National Standard ANSI www.ansi.org

ASHRAE Standing Standard Project Committee 90.1
Cognizant TC: 7.6, Systems Energy Utilization
SPLS Liaison: Roger Hedrick
ASHRAE Staff Liaison: Steven C. Ferguson
IES Liaison: Rita M. Harrold

Drake Erbe*, *Chair*	Harry Misuriello*	John Dunlap
Thomas Culp*, *Vice-Chair*	Frank Morrison*	Chuck Foster
Richard, Lord*, *Vice-Chair*	Frank Myers*	Sam Francis
Peter Baselici *	Ron Nickson*	John Green
Sean Beilman*	Tim Peglow*	Chad Groshart
Jeff Boldt*	Eric Richman*	David Handwork
Ernie Conrad*	Steve Rosenstock*	Stan Harbuck
Charles Cottrell*	Bob Ross*	Mike Houston
Jay Crandall*	Marty Salzburg*	Richard Hermans
Craig Drumheller*	Leonard Sciarra*	Michael Ivanovich
Jim Garrigus*	Frank Stanonik*	Hy Kaplan
Jason Glazer*	Wayne Stoppelmoor*	Neil Leslie
Krishnan Gowri*	Christian Taber*	Merle McBride
Pekka Hakkarainen*	William Talbert*	Benjamin Meyer
Susanna Hanson*	Steven Taylor*	Keith Nelson
Richard Heinisch*	Martha VanGeem*	Steve Orlowski
Ned Heminger*	McHenry Wallace*	Amy Schmidt
Dave Herron*	Jerry White*	David Shepherd
Scott Hintz*	Jeremy Williams*	Don Surrena
John Hogan*	Karim Amrane	Stephen Szoke
Jonathan Humble*	Gary Ash	Mike Tillou
Itzhak Maor*	Joseph Brooks	Doug Tucker
Chris Mathis*	Don Brundage	Richard Watson
Michael Mehl*	Brandon Damas	Jason Wilen

** Denotes voting member at time of publication.*

ASHRAE STANDARDS COMMITTEE 2016–2017

Rita M. Harrold, *Chair*
Steven J. Emmerich, *Vice-Chair*
James D. Aswegan
Niels Bidstrup
Donald M. Brundage
Waller S. Clements
Drury B. Crawley
John F. Dunlap,
James W. Earley, Jr.
Keith I. Emerson
Julie M. Ferguson
Michael W. Gallagher
Walter T. Grondzik
Vinod P. Gupta
Susanna S. Hanson
Roger L. Hedrick
Rick M. Heiden
Srinivas Katipamula
Arsen K. Melikov
R. Lee Millies, Jr.
Cyrus H. Nasseri
David Robin
Peter Simmonds
Dennis A. Stanke
Wayne H. Stoppelmoor, Jr.
Jack H. Zarour
William F. Walter, *BOD ExO*
Patricia Graef, *CO*

Stephanie C. Reiniche, *Senior Manager of Standards*

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 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.

DISCLAIMER

ASHRAE uses its best efforts to promulgate Standards and Guidelines for the benefit of the public in light of available information and accepted industry practices. However, ASHRAE does not guarantee, certify, or assure the safety or performance of any products, components, or systems tested, installed, or operated in accordance with ASHRAE's Standards or Guidelines or that any tests conducted under its Standards or Guidelines will be nonhazardous or free from risk.

ASHRAE INDUSTRIAL ADVERTISING POLICY ON STANDARDS

ASHRAE Standards and Guidelines are established to assist industry and the public by offering a uniform method of testing for rating purposes, by suggesting safe practices in designing and installing equipment, by providing proper definitions of this equipment, and by providing other information that may serve to guide the industry. The creation of ASHRAE Standards and Guidelines is determined by the need for them, and conformance to them is completely voluntary.

In referring to this Standard or Guideline and in marking of equipment and in advertising, no claim shall be made, either stated or implied, that the product has been approved by ASHRAE.

© ASHRAE (www.ashrae.org). For personal use only. Additional reproduction, distribution, or transmission in either print or digital form is not permitted without ASHRAE's prior written permission.

(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 the Lighting Power Densities for both space-by-space and building area methods by including light-emitting diode technology (LED) into the lighting systems. LED technology is included by a review of current product availability, efficacy, distribution capability, and cost. In cases where LED fixtures are available and capable of replacing a current technology product, their efficacy is included in the space models. Not all fixtures in the models are replaced with LED technology, as in some cases there was not a sufficient LED product or the LED technology was not specifically suited for the expected task.

In most all cases, this resulted in a reduction in lighting power density (LPD), recognizing the advanced efficacy of LED technology. In a very few cases (4 space types, 1 building type), the inclusion of LED technology resulted in a comparatively higher LPD. This is a result of an inappropriately high efficacy value assigned to some fluorescent task lighting for the 2013 version of the standard. However, the models that include LED technology in these cases are now correct. In the cases where there is a large reduction in LPD, this reduction is the result of direct replacement of LED with older incandescent or halogen products, not of low-efficiency CFL products.

[Note: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes.]

Addendum ch to 90.1-2013

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

9.5.1 Building Area Method of Calculating Interior Lighting Power Allowance. Use the following steps to determine the interior lighting power allowance by the Building Area Method:

……..

TABLE 9.5.1 Lighting Power Densities Using the Building Area Method (IP Units)	
Building Area Type[a]	**LPD, W/ft^2**
Automotive facility	~~0.69~~ 0.71
Convention center	~~0.74~~ 0.76
Courthouse	~~0.85~~ 0.90
Dining: Bar lounge/leisure	~~0.85~~ 0.90
Dining: Cafeteria/fast food	~~0.75~~ 0.79
Dining: Family	~~0.77~~ 0.78
Dormitory	~~0.59~~ 0.61
Exercise center	~~0.62~~ 0.65
Fire station	~~0.52~~ 0.53
Gymnasium	~~0.67~~ 0.68
Health-care clinic	~~0.74~~ 0.82

© ASHRAE (www.ashrae.org). For personal use only. Additional reproduction, distribution, or transmission in either print or digital form is not permitted without ASHRAE's prior written permission.

Hospital	1.05
Hotel/Motel	~~0.73~~ 0.75
Library	~~1.11~~ 0.78
Manufacturing facility	~~0.89~~ 0.90
Motion picture theater	~~0.67~~ 0.83
Multifamily	~~0.67~~ 0.68
Museum	~~0.92~~ 1.06
Office	~~0.75~~ 0.79
Parking garage	0.15
Penitentiary	~~0.70~~ 0.75
Performing arts theater	~~1.12~~ 1.18
Police station	~~0.76~~ 0.80
Post office	~~0.66~~ 0.67
Religious building	~~0.91~~ 0.94
Retail	~~1.05~~ 1.06
School/university	~~0.75~~ 0.81
Sports arena	~~0.79~~ 0.87
Town hall	~~0.74~~ 0.80
Transportation	~~0.59~~ 0.61
Warehouse	0.48
Workshop	~~0.88~~ 0.90

© ASHRAE (www.ashrae.org). For personal use only. Additional reproduction, distribution, or transmission in either print or digital form is not permitted without ASHRAE's prior written permission.

TABLE 9.5.1 Lighting Power Densities Using the Building Area Method (SI units)	
Building Area Type[a]	**LPD, W/m^2**
Automotive facility	7.6~~4~~
Convention center	8. 2~~0~~
Courthouse	9.7~~2~~
Dining: Bar lounge/leisure	9.7~~2~~
Dining: Cafeteria/fast food	8.5~~1~~
Dining: Family	8.4~~3~~
Dormitory	6.6~~4~~
Exercise center	7.0~~6.7~~
Fire station	5.7~~6~~
Gymnasium	7.3~~2~~
Health-care clinic	8.8~~0~~
Hospital	11.3
Hotel/Motel	8.1~~7.9~~
Library	8.4~~12.0~~
Manufacturing facility	9.7~~6~~
Motion picture theater	8.9~~7.2~~
Multifamily	7.3~~2~~
Museum	11.4~~9.9~~
Office	8.5~~1~~
Parking garage	1.6
Penitentiary	8.1~~7.5~~
Performing arts theater	12.7~~1~~
Police station	8.6~~2~~
Post office	7.2~~1~~
Religious building	10.1~~9.8~~
Retail	11.4~~3~~
School/university	8.7~~1~~
Sports arena	9.4~~8.5~~
Town hall	8.6~~0~~
Transportation	6.6~~4~~
Warehouse	5.2
Workshop	9.7~~5~~

© ASHRAE (www.ashrae.org). For personal use only. Additional reproduction, distribution, or transmission in either print or digital form is not permitted without ASHRAE's prior written permission.

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: (1) All REQs shall be implemented. (2) At least one ADD1 (when present) shall be implemented. (3) 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	RCR Threshold	a	b	c	d	e	f	g	h	i
Atrium											
… that is <20 ft in height	0.03/ft (0.10 W/m) total height	NA	REQ	ADD1	ADD1	---	REQ	REQ	---	ADD2	ADD2
… that is e20 ft and d40 ft in height	0.03/ft (0.10 W/m) total height	NA	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… that is >40 ft in height	0.40 + 0.02/ft (0.07 W/m) total height	NA	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Audience Seating Area											
... in an auditorium	0.63	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
... in a convention center	0.82	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in a gymnasium	0.65	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
... in a motion picture theater	1.14	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
... in a penitentiary	0.28	4	REQ	ADD1	ADD1	---	REQ	REQ	---	ADD2	ADD2
... in a performing arts theater	~~2.43~~ 2.03 (21.8 W/m^2)	8	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
... in a religious building	1.53	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
... in a sports arena	0.43	4	REQ	ADD1	ADD1	---	REQ	REQ	---	ADD2	ADD2
… all other audience seating areas	0.43	4	REQ	ADD1	ADD1	---	REQ	REQ	---	ADD2	ADD2
Banking Activity Area	~~1.01~~ 0.86 (9.26 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Breakroom (See Lounge/Breakroom)											
Classroom/Lecture Hall/Training Room											
… in a penitentiary	1.34	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	REQ	---
… all other	~~1.24~~ 0.96 (10.3	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	REQ	---

classrooms/lecture halls/ training rooms	W/m^2)										
Conference / Meeting / Multipurpose Room	~~1.23~~ 1.07 (11.5 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	REQ	---
Confinement Cells	0.81	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Copy/Print Room	~~0.72~~ 0.56 (6.0 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	REQ	---
Corridor[2]											
… in a facility for the visually impaired (and not used primarily by the staff)[3]	0.92	width<8 ft	REQ	---	---	---	REQ	REQ	REQ	ADD2	ADD2
… in a hospital	~~0.99~~ 0.92 (9.9 W/m^2)	width<8 ft	REQ	---	---	---	REQ	REQ	ADD2	ADD2	ADD2
… in a manufacturing facility	~~0.41~~ 0.29 (3.1 W/m^2)	width<8 ft	REQ	---	---	---	REQ	REQ	---	ADD2	ADD2
…all other corridors	0.66	width<8 ft	REQ	---	---	---	REQ	REQ	REQ	ADD2	ADD2
Courtroom	~~1.72~~ 1.39 (15 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Computer Room	~~1.71~~ 1.33(14.3 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Dining Area											
… in a penitentiary	0.96 (10.3 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in a facility for the visually impaired (and not used primarily by the staff)[3]	~~2.65~~ 2.00(21.5 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in bar/lounge or leisure dining	~~1.07~~ 0.93(10 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in cafeteria or fast food dining	~~0.65~~ 0.63(6.8 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in family dining	~~0.89~~ 0.71(7.6 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… all other dining areas	~~0.65~~ 0.63(6.8 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Electrical/Mechanical Room[7]	~~0.42~~ 0.43(4.6 W/m^2)	6	REQ	---	---	---	REQ	REQ	---	---	---
Emergency Vehicle Garage	~~0.56~~ 0.41(4.4 W/m^2)	4	REQ	ADD1	ADD1	---	REQ	REQ	---	ADD2	ADD2
Food Preparation Area	~~1.21~~1.06(11.4 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Guest Room	~~0.91~~ 0.77(8.3 W/m^2)	6	See Section 9.4.1.3b.								
Laboratory											
… in or as a classroom	~~1.43~~ 1.20(12.9 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	REQ	ADD2	ADD2
… all other laboratories	~~1.81~~ 1.45(15.6 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2

© ASHRAE (www.ashrae.org). For personal use only. Additional reproduction, distribution, or transmission in either print or digital form is not permitted without ASHRAE's prior written permission.

Laundry/Washing Area	~~0.60~~ 0.43(4.6 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Loading Dock, Interior	~~0.47~~ 0.58(6.2 W/m^2)	6	REQ	ADD1	ADD1	---	REQ	REQ	---	ADD2	ADD2
Lobby											
… in a facility for the visually impaired (and not used primarily by the staff)[3]	~~1.80~~2.03(21.8 W/m^2)	4	REQ	---	---	---	REQ	REQ	REQ	ADD2	ADD2
… for an elevator	~~0.64~~ 0.68 (7.3 W/m^2)	6	REQ	---	---	---	REQ	REQ	---	ADD2	ADD2
… in a hotel	1.06 (11.4 W/m^2)	4	REQ	---	---	---	REQ	REQ	---	ADD2	ADD2
… in a motion picture theater	~~0.59~~ 0.45(4.8 W/m^2)	4	REQ	---	---	---	REQ	REQ	---	ADD2	ADD2
… in a performing arts theater	~~2.00~~ 1.70(18.3 W/m^2)	6	REQ	---	---	---	REQ	REQ	REQ	ADD2	ADD2
… all other lobbies	~~0.90~~ 1.00(10.8 W/m^2)	4	REQ	---	---	---	REQ	REQ	REQ	ADD2	ADD2
Locker Room	~~0.75~~ 0.48(5.2 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	REQ	---
Lounge/Breakroom											
… in a healthcare facility	~~0.92~~ 0.78(8.4 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	REQ	---
… all other lounges/Breakrooms	~~0.73~~ 0.62(6.7 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	REQ	---
Office											
… enclosed and d250 ft^2	~~1.11~~ 0.93(10 W/m^2)	8	REQ	ADD1	ADD1	REQ	REQ	REQ	---	REQ	---
… enclosed and >250 ft^2	~~1.11~~ 0.93(10 W/m^2)	8	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… open plan	~~0.98~~ 0.81(8.7 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Parking Area, Interior	~~0.19~~ 0.14(1.5 W/m^2)	4	See Section 9.4.1.2.								
Pharmacy Area	~~1.68~~ 1.34(14.4 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Restroom											
… in a facility for the visually impaired (and not used primarily by the staff)[3]	~~1.21~~ 0.96(10.3 W/m^2)	8	REQ	---	---	---	REQ	REQ	---	REQ	---
… all other restrooms	~~0.98~~ 0.85(9.1 W/m^2)	8	REQ	---	---	---	REQ	REQ	---	REQ	---
Sales Area[4]	~~1.44~~ 1.22(13.1 W/m^2)	6	REQ	ADD1	ADD1	REQ	---	REQ	---	ADD2	ADD2
Seating Area, General	~~0.54~~ 0.42(15.3 W/m^2)	4	REQ	ADD1	ADD1	---	REQ	REQ	---	ADD2	ADD2
Stairway	The space containing the stairway shall determine the LPD and control requirements for the stairway.										

Stairwell	~~0.69~~ 0.58(6.2 W/m^2)	10	REQ	---	---	REQ	REQ	REQ	REQ	ADD2	ADD2
Storage Room											
… <50 ft^2	~~1.24~~ 0.97(10.4 W/m^2)	6	REQ	---	---	---	---	---	---	ADD2	ADD2
… e50 ft^2 and d 1000 ft^2	~~0.63~~ 0.46(4.9 W/m^2)	6	REQ	ADD1	ADD1	---	REQ	REQ	---	REQ	---
… all other storage rooms	~~0.63~~ 0.46(4.9 W/m^2)	6	REQ	ADD1	ADD1	---	REQ	REQ	REQ	ADD2	ADD2
Vehicular Maintenance Area	~~0.67~~ 0.56(6.0 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Workshop	~~1.59~~01.14(12.3 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2

1. 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
2. In corridors, the extra lighting power density allowance is permitted when the width of the corridor is less than 8 ft and is not based on the RCR.
3. 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.
4. For accent lighting, see Section 9.6.2(b).
5. Sometimes referred to as a "Picking Area."
6. Automatic daylight responsive controls are mandatory only if the requirements of the specified sections are present.
7. An additional ~~0.53~~ 0.52 W/ft^2 (~~5.7~~ 5.6 W/m^2) shall be allowed, provided that the additional lighting is controlled separately from the base allowance of 0.42 W/ft^2 (4.6 W/m^2). The additional ~~0.53~~ 0.52 W/ft^2 allowance shall not be used for any other purpose.
8. Class of play as defined by IES RP-6.

Building Type Specific/Space Types[1]	LPD W/ft^2	RCR Threshold	a	b	c	d	e	f	g	h	i
Facility for the Visually Impaired[3]											
…in a chapel (used primarily by residents)	~~2.21~~ 1.06 (11.4 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in a recreation room/common living room (and not used primarily by staff)	~~2.41~~ 1.80(19.4 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Automotive (See "Vehicular Maintenance Area")											
Convention Center—Exhibit Space	~~1.45~~ 0.88(9.5 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Dormitory—Living Quarters	~~0.38~~ 0.54(5.8 W/m^2)	8	REQ	---	---	---	---	---	---	--	--
Fire Station—Sleeping Quarters	~~0.22~~ 0.20(2.2 W/m^2)	6	REQ	---	---	---	---	---	---	--	--
Facility for the Visually Impaired[3]											
… in a recreation room/common living room (and not used primarily by staff)	~~2.41~~ 1.80(19.4 W/m^2)	6	---	---	---	---	---	---	---	--	--

© ASHRAE (www.ashrae.org). For personal use only. Additional reproduction, distribution, or transmission in either print or digital form is not permitted without ASHRAE's prior written permission.

Gymnasium/Fitness Center											
… in an exercise area	~~0.72~~ 0.50(5.4 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in a playing area	~~1.20~~ 0.82(8.8 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Healthcare Facility											
… in an exam/treatment room	~~1.66~~ 1.68(18.1 W/m^2)	8	REQ	---	---	REQ	REQ	REQ	---	ADD2	ADD2
… in an imaging room	~~1.51~~ 1.06(11.4 W/m^2)	6	REQ	---	---	REQ	---	---	---	ADD2	ADD2
….in a medical supply room	~~0.74~~ 0.54(5.8 W/m^2)	6	(See “Storage Room” under “Common Space Types” for control requirements)								
… in a nursery	~~0.88~~ 1.00(10.8 W/m^2)	6	REQ	---	---	REQ	REQ	REQ	---	ADD2	ADD2
… in a nurse’s station	~~0.71~~ 0.81(8.7 W/m^2)	6	REQ	---	---	REQ	REQ	REQ	---	ADD2	ADD2
… in an operating room	~~2.48~~ 2.17(23.4 W/m^2)	6	REQ	---	---	REQ	---	---	---	ADD2	ADD2
… in a patient room	~~0.62~~ 0.62(6.7 W/m^2)	6	REQ	---	---	REQ	REQ	REQ	---	ADD2	ADD2
… in a physical therapy room	~~0.91~~ 0.84(9.0 W/m^2)	6	REQ	---	---	REQ	REQ	REQ	---	ADD2	ADD2
… in a recovery room	~~1.15~~ 1.03(11.1 W/m^2)	6	REQ	---	---	REQ	REQ	REQ	---	ADD2	ADD2
Library											
… in a reading area	~~1.06~~ 0.82(8.8 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in the stacks	~~1.71~~1.20 (12.9w/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	REQ	ADD2	ADD2
Manufacturing Facility											
… in a detailed manufacturing area	~~1.29~~ 0.93(10 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in an equipment room	~~0.74~~ 0.65(7.0 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in an extra high bay area (>50 ft floor-to-ceiling height)	1.05	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in a high bay area (25–50 ft floor-to-ceiling height)	~~1.23~~ 0.75(8.1 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in a low bay area (<25 ft floor-to-ceiling height)	~~1.19~~ 0.96(10.3 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Museum											
… in a general exhibition area	~~1.05~~ 1.05(11.3 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in a restoration room	~~1.02~~ 0.85(9.2 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Performing Arts Theater—	~~0.61~~ 0.36(3.9	6	REQ	ADD1	ADD1	REQ	REQ	REQ	---	REQ	---

Dressing Room	W/m^2)										
Post Office—Sorting Area	~~0.94~~ 0.68(7.3 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	REQ	ADD2	ADD2
Religious Buildings											
… in a fellowship hall	~~0.64~~ 0.55(5.9 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… in a worship/pulpit/choir area	1.53	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Retail Facilities											
… in a dressing/fitting room	~~0.71~~ 0.5(5.4 W/m^2)	8	REQ	ADD1	ADD1	REQ	---	REQ	---	REQ	---
… in a mall concourse	~~1.10~~0.9 (9.7 w/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Sports Arena—Playing Area[8]											
… for a Class I facility	~~3.68~~2.47 (26.6 w/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… for a Class II facility	~~2.40~~ 1.96(21.1 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… for a Class III facility	~~1.80~~ 1.70(18.3 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
… for a Class IV facility	~~1.20~~ 1.13(12.2 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Transportation Facility											
… in a baggage/carousel area	~~0.53~~ 0.45(4.8 W/m^2)	4	REQ	ADD1	ADD1	---	REQ	REQ	---	ADD2	ADD2
… in an airport concourse	~~0.36~~ 0.31(3.3 W/m^2)	4	REQ	ADD1	ADD1	---	REQ	REQ	---	ADD2	ADD2
… at a terminal ticket counter	~~0.80~~ 0.62(6.7 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	---	ADD2	ADD2
Warehouse—Storage Area											
…for medium to bulky, palletized items	~~0.58~~ 0.35(3.8 W/m^2)	4	REQ	ADD1	ADD1	REQ	REQ	REQ	REQ	ADD2	ADD2
… for smaller, hand-carried items[5]	~~0.95~~ 0.69(7.4 W/m^2)	6	REQ	ADD1	ADD1	REQ	REQ	REQ	REQ	ADD2	ADD2

1. 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
2. In corridors, the extra lighting power density allowance is permitted when the width of the corridor is less than 8 ft and is not based on the RCR.
3. 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.
4. For accent lighting, see Section 9.6.2(b).
5. Sometimes referred to as a "Picking Area."
6. Automatic daylight responsive controls are mandatory only if the requirements of the specified sections are present.
7. An additional ~~0.53~~ 0.52 W/ft^2 (~~5.7~~ 5.6 W/m^2) shall be allowed, provided that the additional lighting is controlled separately from the base allowance of 0.42 W/ft^2 (4.6 W/m^2). The additional ~~0.53~~ 0.52 W/ft^2 allowance shall not be used for any other purpose.
8. Class of play as defined by IES RP-6.

© ASHRAE (www.ashrae.org). For personal use only. Additional reproduction, distribution, or transmission in either print or digital form is not permitted without ASHRAE's prior written permission.

Add the following to Appendix E:

9.6.1 IES RP-6 (2015) Recommended Practice for Sports and Recreational Area Lighting

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.

ASHRAE · 1791 Tullie Circle NE · Atlanta, GA 30329 · www.ashrae.org

7/16