



**BSR/ASHRAE/IES Addendum BB
to ANSI/ASHRAE/IES Standard 90.1-2016**

Public Review Draft

Proposed Addendum BB to Standard 90.1-2016, Energy Standard for Buildings Except Low-Rise Residential Buildings

**Second Public Review (November 2018)
(Draft Shows Proposed Independent Substantive
Changes to Previous Public Review Draft)**

This draft has been recommended for public review by the responsible project committee. To submit a comment on this proposed standard, go to the ASHRAE website at www.ashrae.org/standards-research--technology/public-review-drafts and access the online comment database. The draft is subject to modification until it is approved for publication by the Board of Directors and ANSI. Until this time, the current edition of the standard (as modified by any published addenda on the ASHRAE website) remains in effect. The current edition of any standard may be purchased from the ASHRAE Online Store at www.ashrae.org/bookstore or by calling 404-636-8400 or 1-800-727-4723 (for orders in the U.S. or Canada).

This standard is under continuous maintenance. To propose a change to the current standard, use the change submittal form available on the ASHRAE website, www.ashrae.org.

The appearance of any technical data or editorial material in this public review document does not constitute endorsement, warranty, or guaranty by ASHRAE of any product, service, process, procedure, or design, and ASHRAE expressly disclaims such.

© 2018 ASHRAE. This draft is covered under ASHRAE copyright. Permission to reproduce or redistribute all or any part of this document must be obtained from the ASHRAE Manager of Standards, 1791 Tullie Circle, NE, Atlanta, GA 30329. Phone: 404-636-8400, Ext. 1125. Fax: 404-321-5478. E-mail: standards.section@ashrae.org.

ASHRAE, 1791 Tullie Circle, NE, Atlanta GA 30329-2305

This draft is covered under ASHRAE copyright. The appearance of any technical data or editorial material in this publication document does not constitute endorsement, warranty, or guaranty by ASHRAE of any product, service, process, procedure, design or the like and ASHRAE expressly disclaims such. Permission to republish or redistribute must be obtained from the MOS.

(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

In response to comments received during the first public review, revisions were made to the model. Because of this a number of values changed. A typo resulting in an incorrect value for audience seating area - performance arts theatre was corrected and the space type, audience seating area – convention center was removed as it was deemed to be unused.

Addendum bb to 90.1-2016

Modify the standard as follows (IP and SI Units)

Note: other portions of table not shown are unchanged.

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.

Common Space Types ¹	LPD Allowances, W/ft ²	RCR Threshold
Atrium		
<20 ft in height	0.48	NA
≥20 ft and ≤40 ft in height	0.57	NA
>40 ft in height	0.70	11
Audience Seating Area		
Auditorium	0.61	6
Convention center	0.25	4
Gymnasium	0.23	6
Motion picture theater	0.27	4
Penitentiary	0.67	4
Performing arts theater	4.06 <u>1.16</u>	8
Religious facility	0.72	4
Sports arena	0.33	4
All other audience seating areas	0.23	4
Banking Activity Area		
Breakroom (See Lounge/Breakroom)		
Classroom/Lecture Hall/Training Room		
Penitentiary	1.38	4
All other classrooms/lecture halls/training rooms	0.84 <u>0.78</u>	4
<i>Informative Note:</i> 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.		
Common Space Types ¹	LPD, W/ft ²	RCR Threshold
Conference/Meeting/Multipurpose Room	0.97	6
Confinement Cells	0.70	6
Copy/Print Room	0.31	6

BSR/ASHRAE/IES Addendum BB to ANSI/ASHRAE Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*
 Second Public Review Draft – Independent Substantive Changes

Corridor²		
Facility for the visually impaired (and not used primarily by the staff) ³	0.71	width <8 ft
Hospital	0.71	width <8 ft
All other corridors	0.41	width <8 ft
Courtroom	1.25	6
Computer Room	1.00	4
Dining Area		
Penitentiary	0.42	6
Facility for the visually impaired (and not used primarily by staff) ³	1.38	4
Bar/lounge or leisure dining	0.86	4
Cafeteria or fast food dining	0.40	4
Family dining	0.60	4
All other dining areas	0.43	4

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.

Common Space Types ¹	LPD, W/ft ²	RCR Threshold
Electrical/Mechanical Room ⁷	0.42 <u>0.43</u>	6
Emergency Vehicle Garage	0.52	4
Food Preparation Area	1.29	6
Guest Room	0.41	6
Laboratory		
In or as a classroom	1.17	6
All other laboratories	1.70	6
Laundry/Washing Area	0.59	4
Loading Dock, Interior	0.88	6
Lobby		
Facility for the visually impaired (and not used primarily by the staff) ³	2.49	4
Elevator	0.71	6
Hotel	0.51	5
Motion picture theater	0.23	4
Performing arts theater	1.25	8
All other lobbies	1.11	4
Locker Room	0.52	6

BSR/ASHRAE/IES Addendum BB to ANSI/ASHRAE Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*
 Second Public Review Draft – Independent Substantive Changes

Lounge/Breakroom

Healthcare facility	0.42	6
All other lounges/breakrooms	0.59	4

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.

Common Space Types ¹	LPD, W/ft ²	RCR Threshold
---------------------------------	------------------------	---------------

Office

Enclosed and ≤250 ft ²	0.88 <u>0.74</u>	8
Enclosed and >250 ft ²	0.79 <u>0.66</u>	8
Open plan	0.67 <u>0.61</u>	4
Parking Area, Interior	0.15	4
Pharmacy Area	1.90	6

Restroom

Facility for the visually impaired (and not used primarily by the staff) ³	1.26	8
All other restrooms	0.63	8
Sales Area ⁴	1.12	6
Seating Area, General	0.23	4

Stairway

Stairwell	0.49	10
-----------	------	----

Storage Room

<50 ft ²	0.40	9
≥50 ft ² and ≤1000 ft ²	0.38	6
All other storage rooms	0.38	6
Vehicular Maintenance Area	0.60	4
Workshop	1.26	6

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.

Building Type Specific/Space Types ¹	LPD W/ft ²	RCR Threshold
---	-----------------------	---------------

Facility for the Visually Impaired³

Chapel (used primarily by residents)	0.70	4
Recreation room/common living room (and not used primarily by staff)	1.77	6

Automotive (See "Vehicular Maintenance Area")

BSR/ASHRAE/IES Addendum BB to ANSI/ASHRAE Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*
 Second Public Review Draft – Independent Substantive Changes

Convention Center—Exhibit Space	0.50 <u>0.61</u>	4
Dormitory—Living Quarters	0.84	8
Fire Station—Sleeping Quarters	0.20 <u>0.23</u>	6
Gymnasium/Fitness Center		
Exercise area	0.90	4
Playing area	0.85	4
Healthcare Facility		
Exam/treatment room	1.40	8
Imaging room	0.85	6
Medical supply room	0.62	6
Nursery	1.37	6
Nurse's station	1.11	6
Operating room	2.26	6
Patient room	0.68	6
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.		
Building Type Specific/Space Types ¹	LPD W/ft ²	RCR Threshold
Physical therapy room	0.91	6
Recovery room	1.25	6
Library		
Reading area	0.96	4
Stacks	1.16 <u>1.18</u>	4
Manufacturing Facility		
Detailed manufacturing area	0.80	4
Equipment room	0.76	6
Extra high bay area (>50 ft floor-to-ceiling height)	1.42	8
High bay area (25 to 50 ft floor-to-ceiling height)	1.24	6
Low bay area (<25 ft floor-to-ceiling height)	0.86	3
Museum		
General exhibition area	0.31	6
Restoration room	1.10	6
Performing Arts Theater—Dressing Room	0.41	6
Post Office—Sorting Area	0.76	4

BSR/ASHRAE/IES Addendum BB to ANSI/ASHRAE Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*
 Second Public Review Draft – Independent Substantive Changes

Religious Facility

Fellowship hall	0.54	4
Worship/pulpit/choir area	0.85	4

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.

Building Type Specific/Space Types ¹	LPD W/ft ²	RCR Threshold
---	-----------------------	---------------

Retail Facilities

Dressing/fitting room	0.51	8
Mall concourse	1.03	4

Sports Arena—Playing Area⁸

Class I facility	2.94	4
Class II facility	2.01	4
Class III facility	1.30	4
Class IV facility	0.86	4

Transportation Facility

Baggage/carousel area	0.39	4
Airport concourse	0.25	4
Ticket counter	0.51	4

Warehouse—Storage Area

Medium to bulky, palletized items	0.33	4
Smaller, hand-carried items ⁵	0.69	6

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 0.52 W/ft² shall be allowed, provided that the additional lighting is controlled separately from the base allowance of 0.43 W/ft². The additional 0.52 W/ft² allowance shall not be used for any other purpose.
8. Class of play as defined by IES RP-6.

Note: other portions of table not shown are unchanged.

SI Units

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.		
Common Space Types ¹	LPD Allowances, W/m ²	RCR Threshold
Atrium		
<6.1 m in height	5.1	NA
≥6.1 m and ≤12.2 m in height	6.1	NA
>12.2 m in height	7.5	11
Audience Seating Area		
Auditorium	6.5	6
Convention center	2.7	4
Gymnasium	2.5	6
Motion picture theater	2.9	4
Penitentiary	7.2	4
Performing arts theater	11.4-12.5	8
Religious facility	7.8	4
Sports arena	3.5	4
All other audience seating areas	2.5	4
Banking Activity Area		
Banking Activity Area	6.5	6
Breakroom (See Lounge/Breakroom)		
Classroom/Lecture Hall/Training Room		
Penitentiary	14.8	4
All other classrooms/lecture halls/training rooms	9.0-8.4	4
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.		
Common Space Types ¹	LPD, W/m ²	RCR Threshold
Conference/Meeting/Multipurpose Room	10.5	6
Confinement Cells	7.5	6
Copy/Print Room	3.3	6
Corridor²		
Facility for the visually impaired (and not used primarily by the staff) ³	7.7	width <2.4 m

BSR/ASHRAE/IES Addendum BB to ANSI/ASHRAE Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*
 Second Public Review Draft – Independent Substantive Changes

Hospital	7.7	width <2.4 m
All other corridors	4.4	width <2.4 m
Courtroom	13.5	6
Computer Room	10.7	4
Dining Area		
Penitentiary	4.5	6
Facility for the visually impaired (and not used primarily by staff) ³	14.8	4
Bar/lounge or leisure dining	9.3	4
Cafeteria or fast food dining	4.3	4
Family dining	6.5	4
All other dining areas	4.7	4

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.

Common Space Types ¹	LPD, W/m ²	RCR Threshold
Electrical/Mechanical Room ⁷	4.5 <u>4.6</u>	6
Emergency Vehicle Garage	5.6	4
Food Preparation Area	13.9	6
Guest Room	4.4	6
Laboratory		
In or as a classroom	12.6	6
All other laboratories	18.3	6
Laundry/Washing Area	6.3	4
Loading Dock, Interior	9.5	6
Lobby		
Facility for the visually impaired (and not used primarily by the staff) ³	26.8	4
Elevator	7.7	6
Hotel	5.4	5
Motion picture theater	2.5	4
Performing arts theater	13.5	8
All other lobbies	11.9	4
Locker Room	5.6	6
Lounge/Breakroom		
Healthcare facility	4.5	6
All other lounges/breakrooms	6.3	4

BSR/ASHRAE/IES Addendum BB to ANSI/ASHRAE Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*
 Second Public Review Draft – Independent Substantive Changes

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.

Common Space Types ¹	LPD, W/m ²	RCR Threshold
Office		
Enclosed and ≤23.2 m ²	9.5 <u>8.0</u>	8
Enclosed and >23.2 m ²	8.5 <u>7.1</u>	8
Open plan	7.2 <u>6.6</u>	4
Parking Area, Interior	1.6	4
Pharmacy Area	20.4	6
Restroom		
Facility for the visually impaired (and not used primarily by the staff) ³	13.5	8
All other restrooms	6.8	8
Sales Area ⁴	12.0	6
Seating Area, General	2.5	4
Stairway		
Stairwell	5.3	10
Storage Room		
<4.6 m ²	4.3	9
≥4.60 m ² and ≤305 m ²	4.1	6
All other storage rooms	4.1	6
Vehicular Maintenance Area	6.5	4
Workshop	13.5	6

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.

Building Type Specific/Space Types ¹	LPD W/m ²	RCR Threshold
Facility for the Visually Impaired³		
Chapel (used primarily by residents)	7.5	4
Recreation room/common living room (and not used primarily by staff)	19.0	6
Automotive (See “Vehicular Maintenance Area”)		
Convention Center—Exhibit <i>Space</i>	5.4 <u>6.6</u>	4
Dormitory—Living Quarters	9.0	8
Fire Station—Sleeping Quarters	2.2 <u>2.5</u>	6

BSR/ASHRAE/IES Addendum BB to ANSI/ASHRAE Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*
 Second Public Review Draft – Independent Substantive Changes

Gymnasium/Fitness Center

Exercise area	9.6	4
Playing area	9.2	4

Healthcare Facility

Exam/treatment room	15.1	8
Imaging room	9.2	6
Medical supply room	6.7	6
Nursery	14.8	6
Nurse's station	11.9	6
Operating room	24.3	6
Patient room	7.3	6

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.

Building Type Specific/Space Types1	LPD W/m2	RCR Threshold
-------------------------------------	----------	---------------

Physical therapy room	9.8	6
Recovery room	13.5	6

Library

Reading area	10.3	4
Stacks	42.5 12.7	4

Manufacturing Facility

Detailed manufacturing area	8.6	4
<i>Equipment</i> room	8.2	6
Extra high bay area (>15.2 m <i>floor-to-ceiling</i> height)	15.3	8
High bay area (7.6 to 15.2 m <i>floor-to-ceiling</i> height)	13.4	6
Low bay area (<7.6 m <i>floor-to-ceiling</i> height)	9.3	3

Museum

General exhibition area	3.3	6
Restoration room	11.9	6
Performing Arts Theater—Dressing Room	4.4	6
Post Office—Sorting Area	8.1	4

Religious Facility

Fellowship hall	5.8	4
Worship/pulpit/choir area	9.2	4

BSR/ASHRAE/IES Addendum BB to ANSI/ASHRAE Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*
 Second Public Review Draft – Independent Substantive Changes

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.

Building Type Specific/Space Types ¹	LPD W/m ²	RCR Threshold
Retail Facilities		
Dressing/fitting room	5.4	8
Mall concourse	11.1	4
Sports Arena—Playing Area⁸		
Class I facility	31.6	4
Class II facility	21.6	4
Class III facility	13.9	4
Class IV facility	9.3	4
Transportation Facility		
Baggage/carousel area	4.2	4
Airport concourse	2.7	4
Ticket counter	5.5	4
Warehouse—Storage Area		
Medium to bulky, palletized items	3.6	4
Smaller, hand-carried items ⁵	7.4	6

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 2.4 m 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 5.6 W/m² shall be allowed, provided that the additional lighting is controlled separately from the base allowance of 4.6 W/m². The additional 5.6 W/m² allowance shall not be used for any other purpose.
8. Class of play as defined by IES RP-6.