

# Public Review Draft

Proposed Addendum as to Standard 189.1-2017

# Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

First Public Review (February 2020)  
(Draft Shows Proposed Changes to Current Standard)

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## Foreword

This proposal updates those LPDs that are greater than 91% of the ASHRAE 90.1-2019 LPDs for most applications. The 91% LPD adjustment value for most of the Standard 189.1 changes because the ASHRAE 90.1-2019 LPDs are based on providing 110% of the maintained light output as recommended by the Illuminating Engineering Society 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 ASHRAE 90.1 subcommittee. **Lighting power density values in red** are those that match the ASHRAE 90.1-2016 Addendum BB (for space by space) or Addendum BG (for whole building method). The less stringent approach was taken for applications where the LPD dropped more than 20% or to more closely match other similar applications or the 10% adder was not taken because the application was already for the visually impaired. Additionally, Standard 189.1 Section 7.4.6.1.1(f) allows a 10% lighting controls credit for institutional tuning; a light control credit that is not available in ASHRAE 90.1 but which is a good practice for high performance buildings so that the installed light levels more closely match the design illuminance. There are also five updated LPD **in green font** with either increased or decreased LPDs primarily due to interpretations of the design light levels of the space.

*[Note to Reviewers: 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. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]*

## Addendum as to 189.1-2017

*Revise Tables 7.4.6.1A and table 7.4.6.1B as follows:*

**Table 7.4.6.1A Lighting Power Densities Using the Building Area Method**

Building Area Type <sup>a</sup>	LPD, W/ft <sup>2</sup>	LPD, W/m <sup>2</sup>
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

Building Area Type <sup>a</sup>	LPD, W/ft <sup>2</sup>	LPD, W/m <sup>2</sup>
Dormitory	<del>0.52</del> <u>0.48</u>	<del>5.6</del> <u>5.2</u>
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	<del>0.70</del> <u>0.56</u>	<del>7.5</del> <u>6.0</u>
Library	0.72	7.8
Manufacturing facility	0.60	6.5
Motion picture theater	<del>0.62</del> <u>0.44</u>	<del>6.7</del> <u>4.7</u>
Multifamily	<del>0.49</del> <u>0.45</u>	<del>5.3</del> <u>4.8</u>
Museum	<del>0.68</del> <u>0.50</u>	<del>7.3</del> <u>5.4</u>
Office	<del>0.69</del> <u>0.60</u>	<del>7.4</del> 6.5
Parking garage	0.12	1.3
Penitentiary	0.67	7.2
Performing arts theater	<del>0.85</del> <u>0.76</u>	<del>9.1</del> <u>8.2</u>
Police station	0.68	7.3
Post office	0.62	6.7
Religious facility	0.70	7.5
Retail	<del>0.91</del> <u>0.84</u>	<del>9.8</del> <u>9.0</u>
School/university	0.67	7.2
Sports arena	<del>0.76</del> <u>0.69</u>	<del>8.2</del> <u>7.4</u>
Town hall	<del>0.72</del> <u>0.63</u>	<del>7.8</del> <u>6.8</u>
Transportation	<del>0.51</del> <u>0.45</u>	<del>5.5</del> <u>4.9</u>
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**

Common Space Types <sup>1</sup>	LPD,	LPD,	RCR
	W/ft <sup>2</sup>	W/m <sup>2</sup>	Threshold
<b>Informative Note:</b> 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.			
<b>Atrium</b>			
<20 ft (6.1 m) in height	<del>0.023/ft total height</del> <u>0.39</u>	<del>0.81/m total height</del> <u>4.2</u>	NA
≥20 ft (6.1m) and ≤ 40 ft (12.2 m) in height	<del>0.023/ft total height</del> <u>0.48</u>	<del>0.81/m total height</del> <u>5.2</u>	NA
>40 ft (12.2 m) in height	<del>0.30 + 0.015/ft total height</del> <u>0.60</u>	<del>3.2 + 0.53/m total height</del> <u>6.5</u>	NA
<b>Audience Seating Area</b>			
Auditorium	<del>0.67</del> <u>0.44</u>	<del>7.2</del> <u>4.7</u>	6

BSR/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* First Public Review Draft.

Convention center	0.65 <u>0.23</u>	7.0 <u>2.5</u>	4
Gymnasium	0.43 <u>0.23</u>	4.6 <u>2.5</u>	6
Motion picture theater	0.64 <u>0.30</u>	6.9 <u>3.2</u>	4
Penitentiary	0.44	4.7	4
Performing arts theater	1.34 <u>0.75</u>	14.4 <u>8.1</u>	8
Religious building	0.98 <u>0.65</u>	10.5 <u>7.0</u>	4
Sports arena	0.42 <u>0.30</u>	4.5 <u>3.2</u>	4
All other audience seating areas	0.40 <u>0.23</u>	4.3 <u>2.5</u>	4
<b>Banking Activity Area</b>	0.79 <u>0.55</u>	8.5 <u>6.0</u>	6
<b>Breakroom (See Lounge/Breakroom)</b>			
<b>Classroom/Lecture Hall/Training Room</b>			
Penitentiary	1.06 <u>0.81</u>	11.4 <u>8.7</u>	4
All other classrooms/lecture halls/training rooms	0.74 <u>0.65</u>	8.0 <u>6.9</u>	4
<b>Conference/Meeting/Multipurpose Room</b>	0.93 <u>0.88</u>	10 <u>9.5</u>	6
<b>Confinement Cells</b>	0.52	5.6	6
<b>Copy/Print Room</b>	0.50 <u>0.31</u>	5.4 <u>3.3</u>	6
<b>Corridor<sup>2</sup></b>			
Facility for the visually impaired (and not used primarily by the staff) <sup>3</sup>	0.81 <u>0.71</u>	8.7 <u>7.6</u>	width <8 ft (2.4 m)
Hospital	0.81 <u>0.65</u>	8.7 <u>6.9</u>	width <8 ft (2.4 m)
Manufacturing facility	0.28	3.0	width <8 ft (2.4 m)
All other corridors	0.58 <u>0.37</u>	6.2 <u>4.0</u>	width <8 ft (2.4 m)
<b>Courtroom</b>	0.98	10.5	6
<b>Computer Room</b>	1.16 <u>0.85</u>	12.5 <u>9.2</u>	4
<b>Dining Area</b>			
Penitentiary	0.72 <u>0.42</u>	7.8 <u>4.5</u>	6
Facility for the visually impaired (and not used primarily by staff) <sup>3</sup>	1.48 <u>1.27</u>	15.9 <u>13.7</u>	4
Bar/lounge or leisure dining	0.62	6.7	4
Cafeteria or fast food dining	0.53 <u>0.36</u>	5.7 <u>3.9</u>	4
Family dining	0.54	5.8	4
All other dining areas	0.53 <u>0.39</u>	5.7 <u>4.2</u>	4
<b>Electrical/Mechanical Room<sup>7</sup></b>	0.39	4.2	6
<b>Emergency Vehicle Garage</b>	0.53 <u>0.47</u>	5.7 <u>5.1</u>	4
<b>Food Preparation Area</b>	0.92	9.9	6
<b>Guest Room</b>	0.75 <u>0.41</u>	8.1 <u>4.4</u>	6
<b>Laboratory</b>			
In or as a classroom	1.04	11.2	6
All other laboratories	1.24	13.3	6
<b>Laundry/Washing Area</b>	0.43	4.6	4
<b>Loading Dock, Interior</b>	0.51	5.5	6
<b>Lobby</b>			
Facility for the visually impaired (and not used primarily by the staff) <sup>3</sup>	1.30	14.0	4
Elevator	0.52	5.6	6

Hotel	0.68 <u>0.46</u>	7.3 <u>5.0</u>	4
Motion picture theater	0.38 <u>0.30</u>	4.1 <u>3.2</u>	4
Performing arts theater	0.82	8.8	6
All other lobbies	0.86 <u>0.76</u>	9.3 <u>8.2</u>	4
<b>Locker Room</b>	0.45	4.8	6
<b>Lounge/Breakroom</b>			
Healthcare facility	0.53 <u>0.38</u>	5.7 <u>4.1</u>	6
All other lounges/breakrooms	0.44	4.7	4
<b>Office</b>			
Enclosed and ≤250 ft <sup>2</sup> (23 m <sup>2</sup> )	0.85 <u>0.67</u>	9.1 <u>7.2</u>	8
Enclosed and >250 ft <sup>2</sup> (23 m <sup>2</sup> )	0.85 <u>0.60</u>	9.1 <u>6.5</u>	8
Open plan	0.78 <u>0.55</u>	8.4 <u>6.0</u>	4
<b>Parking Area, Interior</b>	0.11	1.2	4
<b>Pharmacy Area</b>	1.23	13.2	6
<b>Restroom</b>			
Facility for the visually impaired (and not used primarily by the staff) <sup>3</sup>	0.81	8.7	8
All other restrooms	0.75 <u>0.57</u>	8.1 <u>6.2</u>	8
<b>Sales Area<sup>4</sup></b>	1.06 <u>0.95</u>	11.4 <u>10.3</u>	6
<b>Seating Area, General</b>	0.38 <u>0.23</u>	4.1 <u>2.5</u>	4
<b>Stairway</b>	The space containing the stairway shall determine the LPD requirements for the stairway		
Stairwell	0.5 <u>0.45</u>	5.4 <u>4.8</u>	10
<b>Storage Room</b>			
<50 ft <sup>2</sup> (4.6m <sup>2</sup> )	0.86 <u>0.51</u>	9.3 <u>5.5</u>	6
≥50 ft <sup>2</sup> (4.6m <sup>2</sup> ) and ≤ 1,000 ft <sup>2</sup> (93 m <sup>2</sup> )	0.43 <u>0.35</u>	4.6 <u>3.7</u>	6
All other storage rooms	0.43 <u>0.35</u>	4.6 <u>3.7</u>	6
<b>Vehicular Maintenance Area</b>	0.53	5.7	4
<b>Workshop</b>	1.09	11.7	6
<b>Facility for the Visually Impaired<sup>3</sup></b>			
Chapel (used primarily by residents)	0.89 <u>0.70</u>	8.9 <u>7.5</u>	4
Recreation room/common living room (and not used primarily by staff)	1.53	15.3	6
<b>Automotive (See “Vehicular Maintenance Area”)</b>			
<b>Convention Center—Exhibit Space</b>	0.69 <u>0.55</u>	7.43 <u>6.0</u>	4
<b>Dormitory—Living Quarters</b>	0.46	4.95	8
<b>Fire Station—Sleeping Quarters</b>	0.19	2.05	6
<b>Gymnasium/Fitness Center</b>			
Exercise area	0.50	5.4	4
Playing area	0.75	8.1	4
<b>Healthcare Facility</b>			
Exam/treatment room	1.16	12.5	8
Imaging room	0.98 <u>0.85</u>	10.5 <u>9.2</u>	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
<b>Library</b>			
Reading area	0.77	8.3	4
Stacks	1.08	11.6	4
<b>Manufacturing Facility</b>			
Detailed manufacturing area	<del>0.86</del> <u>0.80</u>	<del>9.3</del> <u>8.6</u>	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
<b>Museum</b>			
General exhibition area	<del>0.61</del> <u>0.31</u>	<del>6.6</del> <u>3.3</u>	6
Restoration room	0.77	8.3	6
<b>Performing Arts Theater—Dressing Room</b>			
	0.35	3.8	6
<b>Post Office Sorting Area</b>			
	0.66	7.1	4
<b>Religious Buildings</b>			
Fellowship hall	0.42	4.5	4
Worship/pulpit/choir area	<del>0.98</del> <u>0.77</u>	<del>10.5</del> <u>8.3</u>	4
<b>Retail Facilities</b>			
Dressing/fitting room	0.49	5.3	8
Mall concourse	<del>0.79</del> <u>0.53</u>	<del>8.5</del> <u>5.7</u>	4
<b>Sports Arena—Playing Area<sup>8</sup></b>			
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
<b>Transportation Facility</b>			
Baggage/carousel area	<del>0.40</del> <u>0.35</u>	<del>4.3</del> <u>3.8</u>	4
Airport concourse	0.22	2.4	4
Terminal ticket counter	0.48	5.2	4
<b>Warehouse—Storage Area</b>			
Medium to bulky, palletized items	0.27	2.9	4
Smaller, hand-carried items <sup>5</sup>	<del>0.65</del> <u>0.60</u>	<del>7.0</del> <u>6.5</u>	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 (2.4 m) and is not based on the RCR, see Section 7.4.6.1.1(b).
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 7.4.6.1.1(c)

- 5. Sometimes referred to as a “Picking Area.”
- 6. Not used. To keep footnote numbering consistent with ASHRAE 90.1.
- 7. Electrical/Mechanical rooms. An additional 0.50 W/ft<sup>2</sup> (5.4 W/m<sup>2</sup>) shall be allowed, provided that the additional lighting is controlled separately from the base allowance of 0.39 W/ft<sup>2</sup> (4.2 W/m<sup>2</sup>). The additional 0.50 W/ft<sup>2</sup> (5.4 W/m<sup>2</sup>) allowance shall not be used for any other purpose.
- 8. Class of play as defined by IES RP-6.