

## NEW YORK CITY DEPARTMENT OF BUILDINGS

### Notice of Public Hearing and Opportunity to Comment on Proposed Rule

**What are we proposing?** The Department of Buildings (DOB) is proposing to add a new rule to make corrections to the referenced standard ASHRAE 90.1, as identified in Appendix CA of the Energy Conservation Code, and to clarify modeling methodology for lighting and pump controls.

**When and where is the hearing?** DOB will hold a public hearing on the proposed rule. The public hearing will take place at [time] on [date]. The hearing will be in the DOB hearing room at [address].

**How do I comment on the proposed rule?** Anyone can comment on the proposed rule by:

- **Website.** You can submit comments to DOB through the NYC rules website at <http://rules.cityofnewyork.us>.
- **Email.** You can email comments to [dobrules@buildings.nyc.gov](mailto:dobrules@buildings.nyc.gov).
- **Mail.** You can mail comments to the New York City Department of Buildings, Office of the General Counsel, 280 Broadway, 7<sup>th</sup> floor, New York, NY 10007.
- **Fax.** You can fax comments to the New York City Department of Buildings, Office of the General Counsel, at 212-566-3843.
- **Speaking at the hearing.** Anyone who wants to comment on the proposed rule at the public hearing must sign up to speak. You can sign up before the hearing by: (1) calling 212-393-2085; (2) emailing [dobrules@buildings.nyc.gov](mailto:dobrules@buildings.nyc.gov); or (3) signing up in the hearing room before the hearing begins on [date]. You can speak for up to three minutes.

**Is there a deadline to submit written comments?** Yes, you must submit written comments by [insert hearing date].

**What if I need assistance to participate in the hearing?** If you require a reasonable accommodation to participate in the hearing, including, but not limited to, a sign language interpreter, you must notify the Office of the General Counsel by mail or email at the addresses given above or by telephone at 212-393-2085. You must tell us by [insert date a week before the hearing].

**Can I review the comments made on the proposed rule?** You can review the comments made online on the proposed rule by going to the website at <http://rules.cityofnewyork.us>. A few days after the hearing, written comments and a summary of oral comments received at the hearing will be available to the public at the Office of the General Counsel.

**What authorizes DOB to make this rule?** Sections 643 and 1043(a) of the New York City Charter, section 28-103.19 of the New York City Administrative Code and section ECC CA102.1 of the New York City Energy Conservation Code authorize DOB to make this proposed rule. This proposed rule was not included in DOB's regulatory agenda for this fiscal year because it was not contemplated when DOB published the agenda.

**Where can I find DOB's rules?** DOB's rules are in Title 1 of the Rules of the City of New York.

**What rules govern the rulemaking process?** DOB must meet the requirements of Section 1043 of the City Charter when creating or changing rules. This notice is made according to the requirements of Section 1043(b) of the City Charter.

## **Statement of Basis and Purpose of Proposed Rule**

The proposed rule adds a new section 5000-02 regarding lighting control requirements under ASHRAE 90.1 to Title 1 of the RCNY. The proposed rule will add clarifying language to Section 9.4.1.1, item c, which was omitted due to typographical error. The requirement for occupancy controls for open plan offices was added by the City, but the requirement for partial automatic on was intended to be exempted. The proposed rule will also update the requirements of Table 9.6.1 to conform it to the requirements of American Society of Heating, Refrigeration and Air Conditioning Engineers ("ASHRAE") standard 90.1-2013. These control requirements were omitted from Local Law 91 of 2016 due to typographical error. And finally the proposed rule will add more clarity for certain modeling requirements based on published addenda to ASHRAE 90.1-2013. Section 4.2 is revised to clarify that Appendix G is allowed for additions and alterations, and Section 11 is allowed for alterations. Table G3.1, number 6, Lighting, is revised to correct an inconsistency in modeling the lighting baseline requirements for not yet designed spaces and add details on modeling lighting controls. Table G3.1.1-4 is revised to fix a footnote to be consistent with the modeling approach of setting the baseline heat fuel source by climate zone. Table G3.7 clarifies the allowable reduction in lighting LPD when applying occupancy controls to the baseline lighting. Sections G3.1.3.5, G3.1.3.10 and G3.1.3.11 provide more detail for the baseline model with regard to pumps.

The Department of Buildings' authority for this proposed rule is found in sections 643 and 1043 of the New York City Charter, section 28-103.19 of the New York City Administrative Code and section ECC CA102.1 of the New York City Energy Conservation Code.

New material is underlined.

[Deleted material is in brackets.]

"Shall" and "must" denote mandatory requirements and may be used interchangeably in the rules of this department, unless otherwise specified or unless the context clearly indicates otherwise.

Section 1. Chapter 5000 of Title 1 of the Rules of the City of New York is amended by adding a new Section 5000-02 to read as follows:

### **§5000-02 American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. ("ASHRAE") 90.1 amendment relating to lighting controls and modeling requirements.**

Pursuant to Section 28-103.19 of the New York City Administrative Code, ASHRAE 90.1, as modified by Section ECC CA102.1 of the New York City Energy Conservation Code, is hereby amended as follows:

§4.2.1.2 Additions to Existing Buildings shall be amended to read as follows:

**4.2.1.2 Additions to Existing Buildings.** Additions to existing buildings shall comply with either the provisions of Sections 5, 6, 7, 8, 9, and 10 or Section 11 or Normative Appendix G.

**4.2.1.2.1** When an addition to an existing building cannot comply by itself, trade-offs will be allowed by modification to one or more of the existing components of the existing building. Modeling of the modified components of the existing building and addition shall employ the procedures of Section 11 or Normative Appendix G; the addition shall not increase the energy consumption of the existing building plus the addition beyond the energy that would be consumed by the existing building plus the addition if the addition alone did comply.

§4.2.1.3 Alterations to Existing Buildings shall be amended to read as follows:

**4.2.1.3 Alterations of Existing Buildings.** Alterations of existing buildings shall comply with the provisions of Sections 5, 6, 7, 8, 9, and 10 or Section 11 or Normative Appendix G., provided, however, that nothing in this standard shall require

compliance with any provision of this standard if such compliance will result in the increase of energy consumption of the building.]

**Exception[s]:**

1. Historic buildings need not comply with these requirements.
- [2. Where one or more components of an existing building or portions thereof are being replaced, the annual energy consumption of the comprehensive design shall not be greater than the annual energy consumption of a substantially identical design, using the same energy types, in which compliance with the applicable requirements of Sections 5, 6, 7, 8, 9, and 10, as provided in Section 4.2.1.2.1, is verified by a registered design professional by the use of any calculation methods acceptable to the code official. Historic buildings need not comply with these requirements.]

§9.4.1.1, Interior Lighting Controls, item c, shall be amended to read as follows:

c. *Restricted to partial automatic ON:* No more than 50% of the lighting power for the general lighting shall be allowed to be automatically turned on, and none of the remaining lighting shall be automatically turned on. For open plan offices, a control device meeting this requirement shall control no more than 2500 ft<sup>2</sup>.

Table 9.6.1, Lighting Power Density Allowances Using the Space-by-Space Method and Minimum Control Requirements Using Either Method, shall be amended to read as follows:

**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) <sup>6</sup> )	Automatic Daylight Responsive Controls for Toplighting (See Section 9.4.1.1(f) <sup>6</sup> )	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 <sup>1</sup>	LPD W/ft <sup>2</sup>	RCR Threshold	a	b	c	d	e	f	g	h	i	
<b>Atrium</b>												
...that is < 20 ft in height	0.03/ft total height	NA	REQ	ADD1	ADD1	-	REQ	REQ	-	ADD2	ADD2	
...that is ≥ 20 ft and ≤ 40 ft in height	0.03/ft total height	NA	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
...that is > 40 ft in height	0.40 + 0.02/ft total height	NA	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Audience Seating Area</b>												
...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	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	
<b>Banking Activity Area</b>												
...in a banking activity area	1.01	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Breakroom (See Lounge/Breakroom)</b>												
<b>Classroom/Lecture hall/Training Room<sup>8,9</sup></b>												
...in a penitentiary	1.34	4	REQ	REQ	[ADD1] -	REQ	REQ	REQ	-	REQ	-	
...all other classrooms/lecture halls/training rooms	1.24	4	REQ	REQ	[ADD1] -	REQ	REQ	REQ	-	REQ	-	
<b>Conference/Meeting/Multipurpose Room<sup>8,9</sup></b>												
...in a conference/meeting/multipurpose room	1.23	6	REQ	REQ	[ADD1] -	REQ	REQ	REQ	-	REQ	-	
<b>Confinement Cells</b>												
...in a confinement cell	0.81	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Copy/Print Room</b>												
...in a copy/print room	0.72	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	REQ	-	

<b>Corridor<sup>2</sup></b>												
...in a facility for the visually impaired (and not used primarily by the staff) <sup>3</sup>	0.92	width < 8 ft	REQ	-	-	-	REQ	REQ	REQ	ADD2	ADD2	
...in a hospital	0.99	width < 8 ft	REQ	-	-	-	REQ	REQ	ADD2	ADD2	ADD2	
...in a manufacturing facility	0.41	width < 8 ft	REQ	-	-	-	REQ	REQ	-	ADD2	ADD2	
...all other corridors	0.66	width < 8 ft	REQ	-	-	-	REQ	REQ	REQ	ADD2	ADD2	
<b>Courtroom</b>	1.72	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Computer Room</b>	1.71	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Dining Area</b>												
...in a penitentiary	0.96	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
...in a facility for the visually impaired and not used primarily by staff) <sup>3</sup>	2.65	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
...in bar lounge or leisure dining	1.07	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
...in cafeteria or fast food dining <sup>7</sup>	0.65	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
...in family dining	0.89	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
...all other dining areas	0.65	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Electrical/Mechanical Room<sup>7</sup></b>	0.42	6	REQ	-	-	-	REQ	REQ	-	-	-	
<b>Emergency Vehicle Garage</b>	0.56	4	REQ	ADD1	ADD1	-	REQ	REQ	-	ADD2	ADD2	
<b>Food Preparation Area</b>	1.21	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Guest Room</b>	0.91	6										
See Section 9.4.1.3b.												
<b>Laboratory</b>												
...in or as a classroom	1.43	6	REQ	ADD1	ADD1	REQ	REQ	REQ	REQ	ADD2	ADD2	
...all other laboratories	1.81	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Laundry/Washing Area</b>	0.60	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Loading Dock, Interior</b>	0.47	6	REQ	ADD1	ADD1	-	REQ	REQ	-	ADD2	ADD2	
<b>Lobby</b>												
...in a facility for the visually impaired and not used primarily by staff) <sup>3</sup>	1.80	4	REQ	-	-	-	REQ	REQ	REQ	ADD2	ADD2	
...for an elevator	0.64	6	REQ	-	-	-	REQ	REQ	[REQ] -	ADD2	ADD2	
...in a hotel	1.06	4	REQ	-	-	-	REQ	REQ	[REQ] -	ADD2	ADD2	
...in a motion picture theater	0.59	4	REQ	-	-	-	REQ	REQ	[REQ] -	ADD2	ADD2	
...in a performing arts theater	2.00	6	REQ	-	-	-	REQ	REQ	REQ	ADD2	ADD2	
...all other lobbies	0.90	4	REQ	-	-	-	REQ	REQ	REQ	ADD2	ADD2	
<b>Locker Room</b>	0.75	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	REQ	-	
<b>Lounge/Breakroom<sup>8,9</sup></b>												
...in a healthcare facility	0.92	6	REQ	REQ	[ADD1] -	REQ	REQ	REQ	-	REQ	-	
...all other lounges/breakrooms	0.73	4	REQ	REQ	[ADD1] -	REQ	REQ	REQ	-	REQ	-	
<b>Office</b>												
...enclosed and ≤ 250 ft <sup>2(8,9)</sup>	1.0	8	REQ	REQ	[ADD1] -	REQ	REQ	REQ	-	REQ	-	
...enclosed and > 250 ft <sup>2</sup>	1.0	8	REQ	ADD1		REQ	REQ	REQ	-	ADD2	ADD2	
...open plan	0.90	4	REQ	-	REQ	REQ	REQ	REQ	-	REQ	-	
<b>Parking Area, Interior</b>	0.19	4	See Section 9.4.1.2									
<b>Pharmacy Area</b>	1.68	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Restroom</b>												
...in a facility for the visually impaired (and not used primarily by the staff) <sup>3</sup>	1.21	8	REQ	-	-	-	[ - ] REQ	[ - ] REQ	-	REQ	-	

...all other restrooms	0.98	8	REQ	-	-	-	[-] REQ	[-] REQ	-	REQ	-
<b>Sales Area<sup>4</sup></b>	1.30	6	REQ	[-] ADD1	[-] ADD1	[-] REQ	-	[-] REQ	-	ADD2	ADD2
<b>Seating Area, General</b>	0.54	4	REQ	[-] ADD1	[-] ADD1	-	[-] REQ	[-] REQ	-	ADD2	ADD2
<b>Stairway</b>	The space containing the stairway shall determine the LPD and control requirements for the stairway.										
<b>Stairwell</b>	0.69	10	REQ	-	-	[-] REQ	[-] REQ	[-] REQ	[-] REQ	ADD2	ADD2
<b>Storage Room</b>											
...< 50 ft <sup>2</sup>	1.24	6	REQ	-	-	-	-	-	-	ADD2	ADD2
...> 50 ft <sup>2</sup> and ≤1000 ft <sup>2</sup>	0.63	6	REQ	ADD1	ADD1	-	REQ	REQ	-	REQ	-
...all other storage rooms	0.63	6	REQ	ADD1	ADD1	-	REQ	REQ	REQ	ADD2	ADD2
<b>Vehicular Maintenance Area</b>	0.67	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
<b>Workshop</b>	1.59	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2

**TABLE 9.6.1 Lighting Power Density Allowances Using the Space-by-Space Method and Minimum Control Requirements Using Either Method (Continued)**

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.									
Building Type Specific/Space Types <sup>1</sup>	LPD W/ft <sup>2</sup>	RCR Threshold	Local Control (See 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) <sup>6</sup> )	Automatic Daylight Responsive Controls for Toplighting (See Section 9.4.1.1(f) <sup>6</sup> )	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))	
			a	b	c	d	e	f	g	h	i	
<b>Facility for the Visually Impaired<sup>3</sup></b>												
...in a chapel (used primarily by residents)	2.21	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
...in a recreation room/common living room (and not used primarily by staff)	2.41	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Automotive (See "Vehicular Maintenance Area")</b>												
<b>Convention Center-Exhibit Space</b>	1.45	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Dormitory-Living Quarters</b>	0.38	8	REQ	-	-	-	-	-	-	-	-	
<b>Fire Station-Sleeping Quarters</b>	0.22	6	REQ	-	-	-	-	-	-	-	-	
<b>Facility for the Visually Impaired<sup>3</sup></b>												
...in a recreation room/common living room (and not used primarily by staff)	2.41	6	-	-	-	-	-	-	-	-	-	
<b>Gymnasium/Fitness Center</b>												
...in an exercise area	0.72	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
...in a playing area	1.20	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Healthcare Facility</b>												
...in an exam/treatment room	1.66	8	REQ	-	-	[ - ] REQ	REQ	REQ	-	ADD2	ADD2	
...in an imaging room	1.51	6	REQ	-	-	[ - ] REQ	[ REQ ] -	-	-	ADD2	ADD2	
...in a medical supply room	0.74	6	(See "Storage Room" under "Common Space Types" for control requirements)									
...in a nursery	0.88	6	REQ	-	-	[ - ] REQ	REQ	REQ	-	ADD2	ADD2	
...in a nurse's station	0.71	6	REQ	-	-	REQ	REQ	REQ	-	ADD2	ADD2	
...in an operating room	2.48	6	REQ	-	-	REQ	-	-	-	ADD2	ADD2	
...in a patient room	0.62	6	REQ	-	-	REQ	REQ	REQ	-	ADD2	ADD2	
...in a physical therapy room	0.91	6	REQ	-	-	REQ	REQ	REQ	-	ADD2	ADD2	
...in a recovery room	1.15	6	REQ	-	-	REQ	REQ	REQ	-	ADD2	ADD2	
<b>Library</b>												
...in a reading area	1.06	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2	

**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.

Building Type Specific/Space Types <sup>1</sup>	LPD W/ft <sup>2</sup>	RCR Threshold	Local Control (See 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) <sup>6</sup> )	Automatic Daylight Responsive Controls for Toplighting (See Section 9.4.1.1(f) <sup>6</sup> )	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))
	a	b	c	d	e	f	g	h	i		
...in the stacks	1.71	4	REQ	ADD1	ADD1	REQ	REQ	REQ	REQ	ADD2	ADD2
<b>Manufacturing Facility</b>											
...in a detailed manufacturing area	1.29	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
...in an equipment room	0.74	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	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
...in a low bay area (< 25 ft floor-to-ceiling height)	1.19	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
<b>Museum</b>											
...in a general exhibition area	1.05	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
...in a restoration room	1.02	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
<b>Performing Arts</b>	0.61	6	REQ	ADD1	ADD1	REQ	REQ	REQ	-	REQ	-
<b>Theater-Dressing Room</b>											
<b>Post Office-Sorting Area</b>	0.94	4	REQ	ADD1	ADD1	[ADD1] REQ	REQ	REQ	REQ	ADD2	ADD2
<b>Religious Buildings</b>											
...in a fellowship hall	0.64	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
<b>Retail Facilities</b>											
...in a dressing/fitting room	0.71	8	REQ	ADD1	ADD1	REQ	-	REQ	-	REQ	-
...in a mall concourse	1.10	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
<b>Sports Arena-Playing Area</b>											
...for a Class I facility	3.68	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
...for a Class II facility	2.40	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
...for a Class III facility	1.80	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
...for a Class IV facility	1.20	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
<b>Transportation Facility</b>											
...in a baggage/carousel area	0.53	4	REQ	ADD1	ADD1	-	REQ	REQ	-	ADD2	ADD2
...in an airport concourse	0.36	4	REQ	ADD1	ADD1	-	REQ	REQ	-	ADD2	ADD2
...at a terminal ticket counter	0.80	4	REQ	ADD1	ADD1	REQ	REQ	REQ	-	ADD2	ADD2
<b>Warehouse-Storage Area</b>											
...for medium to bulky,	0.58	4	REQ	ADD1	ADD1	REQ	REQ	REQ	REQ	ADD2	ADD2



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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.

Building Type Specific/Space Types <sup>1</sup>	LPD W/ft <sup>2</sup>	RCR Threshold	a	b	c	d	e	f	g	h	i
palletized items ...for smaller, hand- carried items <sup>5</sup>	0.95	6	REQ	ADD1	ADD1	REQ	REQ	REQ	REQ	ADD2	ADD2

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) <sup>6</sup> )	Automatic Daylight Responsive Controls for Toplighting (See Section 9.4.1.1(f) <sup>6</sup> )	Automatic Partial OFF (See Section 9.4.1.1(g))	Automatic Full OFF (See Section 9.4.1.1(h))	Scheduled Shutoff (See Section 9.4.1.1(i))
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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 0.53w/ft<sup>2</sup> shall be allowed, provided that the additional lighting is controlled separately from the base allowance of 0.42 W/ft<sup>2</sup>. The additional 0.53 w/ft<sup>2</sup> allowance shall not be used for any other purpose.
8. Occupant sensor shall not have an override switch that converts from manual-on to automatic-on functionality.
9. The occupant sensor may have a grace period of up to 30 seconds to turn on the lighting automatically after the sensor has turned off the lighting if occupancy is detected.

§G1.3, Trade-Off Limits, shall be amended as follows:

**G1.3 Trade-Off Limits. RESERVED.** [When the proposed modifications apply to less than the whole building, only parameters related to the systems to be modified shall be allowed to vary. Parameters relating to unmodified existing conditions or to future building components shall be identical for determining both the baseline building performance and the proposed building performance. Future building components shall meet the prescriptive requirements of Sections 5.5, 6.5, 7.5, and either 9.5 or 9.6.

When using the performance rating method as an alternative path for minimum standard compliance per Section 4.2.1.1, trade-offs and credits for energy efficiency improvement shall be limited to the scope of work identified in the building permit. For new buildings or additions, the performance rating method results shall not be submitted for building permit approval to the rating authority prior to submittal for approval of the building envelope design.]

TABLE G3.1 Modeling Requirements for Calculating Proposed and Baseline Building Performance, 2, Additions and Alterations, shall be amended to read as follows:

<p><b>2. Additions and Alterations</b></p>	
<p>It is acceptable to predict performance using building models that exclude parts of the existing building provided that all of the following conditions are met:</p> <ul style="list-style-type: none"> <li>a. Work to be performed in excluded parts of the building shall meet the requirements of Sections 5 through 10.</li> <li>b. Excluded parts of the building are served by HVAC systems that are entirely separate from those serving parts of the building that are included in the building model.</li> <li>c. Design space temperature and HVAC system operating setpoints and schedules on either side of the boundary between included and excluded parts of the building are essentially the same.</li> <li>d. If a declining block or similar utility rate is being used in the analysis, and the excluded and included parts of the building are on the same utility meter, the rate shall reflect the utility block or rate for the building plus the addition.</li> </ul>	<p>[Same as proposed building design]</p> <p><u>If the proposed building model excluded parts of the existing building, the baseline building model shall exclude them as well.</u></p> <p><u>When modeled, unmodified existing building component shall follow the same rules as new and modified building components.</u></p>

TABLE G3.1 Modeling Requirements for Calculating Proposed and Baseline Building Performance, 6, Lighting, shall be amended to read as follows:

No.	Proposed Building Performance	Baseline Building Performance
6.	<p><b>Lighting</b></p> <p>Lighting power in the proposed design shall be determined as follows:</p> <p>a. Where a complete lighting system exists, the actual lighting power for each thermal block shall be used in the model.</p> <p>b. Where a lighting system has been designed and submitted with design documents, lighting power shall be determined in accordance with Sections 9.1.3 and 9.1.4.</p> <p>c. Where lighting neither exists nor is submitted with design documents, lighting shall comply with but not exceed the requirements of Section 9. <u>Where space types are known, lighting power shall be determined in accordance with the Space-by-Space Method. Where space types are not known, [L]ighting power shall be determined in accordance with the Building Area Method.</u></p> <p>d. Lighting system power shall include all lighting system components shown or provided for on the plans (including lamps and ballasts and task and furniture-mounted fixtures).</p> <p><b>Exception:</b> For multifamily dwelling units, hotel/motel guest rooms, and other spaces in which lighting systems are connected via receptacles and are not shown or provided for on building plans, assume identical lighting power for the proposed and baseline building designs in the simulations.</p> <p>e. Lighting power for parking garages and building facades shall be modeled.</p> <p>f. <u>For lighting controls, at a minimum, the proposed building design shall contain the mandatory automatic lighting controls specified in Section 9.4.1 (e.g., automatic daylight responsive controls, occupancy sensors, programmable controls, etc.). These controls shall be modeled in accordance with (g) and (h).</u>  <u>[The lighting schedules in the proposed building design shall reflect the mandatory automatic lighting control requirements in Section 9.4.1 (e.g., programmable controls or occupancy sensors).]</u></p> <p><b>[Exception:]</b>  <u>g. Automatic daylighting responsive controls [required by Section 9.4.1] shall be modeled directly in the proposed building design or through schedule adjustments determined by a separate daylighting analysis approved by the rating authority. Modeling and schedule adjustments shall separately account for primary sidelighted areas, secondary sidelighted areas, and toplighted areas.</u></p> <p><u>[g.]h. Other [A]automatic lighting controls included in the proposed building design [but not required by Section 9.4.1 may] shall be modeled directly in the building simulation [or] by reducing the lighting schedule each hour by the occupancy sensor reduction factors in Table G3.7 for the applicable space type. This reduction shall be taken only for lighting controlled by the occupancy sensors. Credit for other programmable lighting control in buildings less than 5,000 ft<sup>2</sup> can be taken by reducing the lighting schedule each hour by 10%. [Be modeled in the building simulation through schedule adjustments determined by a separate analysis approved by the authority having jurisdiction. As an alternative to modeling such lighting controls, the proposed building design lighting power may be reduced by the sum of all additional allowances per Section 9.6.2(c) and Table 9.6.2, which are calculated individually as the lighting power under control multiplied by cf, where cf is the appropriate control factor given in Table 9.6.2 corresponding to the space type and the lighting controls designed to be used.]</u></p> <p><u>[h. Credit may be taken for programmable timing controls or occupancy sensors. Exception: No credit is allowed for occupancy sensors in employee lunch and break rooms, conference/meeting rooms, and classrooms (not including shop classrooms, laboratory classrooms, and preschool through 12th grade classrooms.)]</u></p>	<p><u>[a.] [Interior lighting power in the baseline building design shall be determined using the values in Table G3.7 [and the methodology described in Sections 9.6.1 and 9.6.2].</u></p> <p><b>Exceptions:</b> <u>Where lighting neither exists nor is submitted with design documents, and the proposed building lighting power is determined in accordance with the Building Area Method, the baseline lighting power shall be determined in accordance with Table G3.8.</u></p> <p>Lighting shall be modeled having the automatic shutoff controls in buildings &gt; 5000 ft<sup>2</sup> and occupancy sensors in employee lunch and break rooms, conference/meeting rooms, and classrooms (not including shop classrooms, laboratory classrooms, and preschool through 12th grade classrooms). <u>These controls shall be reflected in the baseline building design lighting schedules.</u> No additional automatic lighting controls (e.g., automatic controls for daylight utilization and occupancy sensors in space types not listed above) shall be modeled in the baseline building design. [Additional interior lighting power for nonmandatory controls allowed under Section 9.6.2(c) shall not be included in the baseline building design.]</p> <p>Exterior lighting in areas identified as "Tradable Surfaces" in Table G3.6 shall be modeled with the baseline lighting power shown in Table G3.6. Other exterior lighting shall be modeled the same in the baseline building as in the proposed design.</p> <p><u>[b.] Mandatory automatic lighting controls required by Section 9.4.1 shall be modeled the same as the proposed building design.]</u></p>

Table G3.1.1-4, Baseline System Descriptions, shall be amended to read as follows:

**TABLE G3.1.1-4 Baseline System Descriptions**

System No.	System Type	Fan Control	Cooling Type (1)	Heating Type (1)
1. PTAC	Packaged terminal air conditioner	Constant volume	Direct expansion	Hot-water fossil fuel boiler
2. PTHP	Packaged terminal heat pump	Constant volume	Direct expansion	Electric heat pump
3. PSZ-AC	Packaged rooftop air conditioner	Constant volume	Direct expansion	Fossil fuel furnace
4. PSZ-HP	Packaged rooftop heat pump	Constant volume	Direct expansion	Electric heat pump
5. Packaged VAV with Reheat	Packaged rooftop VAV with reheat	VAV	Direct expansion	Hot-water fossil fuel boiler
6. Packaged VAV with PFP Boxes	Packaged rooftop VAV with parallel fan power boxes	VAV	Direct expansion	Electric resistance

7. VAV with Reheat	and reheat VAV with reheat	VAV	Chilled water	Hot-water fossil fuel boiler
8. VAV with PFP Boxes	VAV with parallel fan-powered boxes and reheat	VAV	Chilled water	Electric resistance
9. Heating and Ventilation	Warm air furnace, gas fired	Constant volume	None	Fossil fuel furnace
10. Heating and Ventilation	Warm air furnace, electric	Constant volume	None	Electric resistance
11. SZ-VAV	Single-zone VAV	VAV	Chilled water	See note 2.
12. SZ-CV-HW	Single zone	Constant volume	Chilled water	Hot-water fossil fuel boiler
13. SZ-CV-ER	Single zone	Constant volume	Chilled water	Electric resistance

**Notes:**

1. For purchased chilled water and purchased heat, see G3.1.1.3.

2. [Where the proposed design heating source is electric or other,] For Climate Zones 0 through 3a, the heating type shall be electric resistance. [Where the proposed design heating source is fossil fuel, fossil/electric hybrid, or purchased heat,] For all other climate zones the heating type shall be hot-water fossil fuel boiler.

§G3.1.3.5, Hot-Water Pumps, shall be amended to read as follows:

**G3.1.3.5 Hot-Water Pumps.** The baseline building design hot-water pump power shall be 19 W/gpm. The pumping system shall be modeled as primary-only with continuous variable flow and a minimum of 25% of the design flow rate. Hot-water systems serving 120,000 ft<sup>2</sup> or more shall be modeled with variable-speed drives, and systems serving less than 120,000 ft<sup>2</sup> shall be modeled as riding the pump curve.

**Exception:** The pump power for systems using purchased heat shall be 14 W/gpm.

§G3.1.3.10, Chilled-Water Pumps, shall be amended to read as follows:

**G3.1.3.10 Chilled-Water Pumps. [(Systems 7, 8, and 11). The baseline building design pump power shall be 22 W/gpm.]** Chilled-water systems [with a cooling capacity of 300 tons or more] shall be modeled as primary/secondary systems with constant flow primary loop and variable flow secondary loop. For systems with a cooling capacity of 300 tons or more, the secondary pump shall be modeled with variable-speed drive[s] on the secondary pumping loop. and a minimum flow of 25% of the design flow rate. [Chilled-water pumps in] For systems [serving] with less than 300 tons cooling capacity [shall be modeled as a primary/secondary systems with] the secondary pump shall be modeled as riding the pump curve. The baseline building constant-volume primary pump power shall be modeled as 9 W/gpm and the variable-flow secondary pump power shall be modeled as 13 W/gpm at design conditions. For computer room systems using System 11 with an integrated water-side economizer, the baseline building design primary chilled-water pump power shall be increased by [5] 3 W/gpm for flow associated with the water-side economizer.

**Comment [DoB1]:** "by" is included in both Appendix CA and in 5000-02

**Comment [DoB2]:** "for" is included in both Appendix CA and in 5000-02

**Exception:** [The pump power for] For systems using purchased chilled water, the building distribution pump shall be modeled with variable-speed drive, a minimum flow of 25% of the design flow rate, and a pump power of [shall be] 16 W/gpm.

§G3.1.3.11, Heat Rejection (Systems 7, 8, 9, 12, and 13), shall be amended to read as follows:

**G3.1.3.11 Heat Rejection (Systems 7, 8, [9, 12, and 13] 11, and 12).** The heat rejection device shall be an axial-fan open-circuit cooling tower with variable-speed fan control and shall have an efficiency of 38.2 gpm/hp at the conditions specified in Table 6.8.1-7. Condenser water design supply temperature shall be calculated using the cooling tower approach to the 0.4% evaporation design wet-bulb temperature as generated by the formula below, with a design temperature rise of 10°F.

**Comment [DoB3]:** "12" is included both in Appendix CA and in 5000-02

$$\text{Approach}_{10^\circ\text{F Range}} = 25.72 - (0.24 \times \text{WB})$$

where WB is the 0.4% evaporation design wet-bulb temperature in °F; valid for wet bulbs from 55°F to 90°F.

The tower shall be controlled to maintain a 70°F leaving water temperature where weather permits, floating up to leaving water temperature at design conditions. The baseline building design condenser-water pump power shall be

19 W/gpm. For computer room systems using System 11 with an integrated water-side economizer, the baseline building design condenser water-pump power shall be increased [5] 3 W/gpm for flow associated with the water-side economizer. Each chiller shall be modeled with separate condenser water and chilled-water pumps interlocked to operate with the associated chiller.

Table G3.7, Performance Rating Method Lighting Power Density Allowances Using the Space-by-Space Method, shall be amended to read as follows:

**TABLE G3.7 Performance Rating Method Lighting Power [Density Allowances] Densities and Occupancy Sensor Reductions Using the Space-by-Space Method**

Common Space Types <sup>a</sup>	Lighting Power Density, W/ft <sup>2</sup>	Occupancy Sensor Reduction <sup>b</sup>	Building Type Specific Space Types <sup>[1]</sup> <sup>c</sup>	Lighting Power Density, W/ft <sup>2</sup>	Occupancy Sensor Reduction <sup>b</sup>
Audience Seating Area			Assisted Living Facility		
...in an auditorium	0.90	10%	...in a chapel (used primarily by residents)	2.77	10%
...in a convention center	0.70	10%	...in a recreation room (used primarily by residents)	3.02	10%
...in an exercise center	0.30	10%	Automotive (See "Vehicular Maintenance Area")		
...in a gymnasium	0.40	10%	Convention Center – Exhibit Space	1.30	35%
...in a motion picture theater	1.20	10%	Dormitory – Living Quarters	1.11	10%
...in a penitentiary	0.70	10%	Fire Station – Sleeping Quarters	0.30	10%
...in a performing arts theater	2.60	10%	Gymnasium/Fitness Center		
...in a religious building	1.70	10%	...in an exercise area	0.90	35%
...in a sports arena	0.40	10%	...in a playing area	1.40	35%
...in a transportation facility	0.50	10%	Healthcare Facility		
...all other audience seating area	0.90	10%	...in an emergency room	2.70	10%
Atrium			...in an exam/treatment room	1.50	10%
...that is ≤ 40 ft in height	0.0375 per foot in total height	10%	...in an imaging room	0.40	22%
...that is > 40 ft in height	0.50 + 0.025 per foot in total height	10%	...in a medical supply room	1.40	45%
Banking Activity Area	1.50	10%	...in a nursery	0.60	10%
Breakroom (See Lounge/Breakroom)			...in a nurse's station	1.00	10%
Classroom/Lecture Hall/Training Room			...in an operating room	2.20	10%
...in a penitentiary	1.30	None	...in a patient room	0.70	10%
...all other classroom/lecture hall/training room	1.40	30%	...in a physical therapy room	0.90	10%
Conference/Meeting/Multipurpose Room	1.30	None	...in a recovery room	0.80	10%
Confinement Cells	0.90	10%	Library		
Copy/Print Room	0.90	10%	...in a reading area	1.20	15%
Corridor			...in the stacks	1.70	15%
...in a facility for the visually impaired (and used primarily by residents)	1.15	25%	Manufacturing Facility		
...in a hospital	1.00	25%	...in a detailed manufacturing area	2.10	10%
...in a manufacturing facility	0.50	25%	...in an equipment room	1.20	10%
...all other corridor	0.50	25%	...in an extra-high bay area (> 50 ft floor-to-ceiling height)	1.32	10%
Courtroom	1.90	10%	...in a high bay area (25-50 ft floor-to-ceiling height)	1.70	10%
Computer Room	2.14	35%	...in a low bay area (< 25 ft floor-to-ceiling height)	1.20	10%
Dining Area			Museum		
...in a penitentiary	1.30	35%	...in a general exhibition area	1.00	10%
...in a facility for the visually impaired (and used primarily by residents)	3.32	35%	...in a restoration room	1.70	10%
...in bar/lounge or leisure dining	1.40	35%	Post Office – Sorting Area	1.20	10%
...in cafeteria or fast food dining	0.90	35%	Religious Buildings		

Common Space Types <sup>a</sup>	Lighting Power Density, W/ft <sup>2</sup>	Occupancy Sensor Reduction <sup>b</sup>	Building Type Specific Space Types <sup>1</sup> <sup>a</sup>	Lighting Power Density, W/ft <sup>2</sup>	Occupancy Sensor Reduction <sup>b</sup>
...in family dining	2.10	35%	...in a fellowship hall	0.90	10%
...all other dining area	0.90	35%	...in a worship/pulpit/choir area	2.40	10%
Electrical/Mechanical Room	1.50	30%	Retail Facilities		
Emergency Vehicle Garage	0.80	10%	...in a dressing/fitting room	0.89	10%
Food Preparation Area	1.20	30%	...in a mall concourse	1.70	10%
Guest Room	1.14	45%	Sport Arena – Playing Area		
Judges Chambers	1.30	30%	...for a Class I facility	4.61	10%
Laboratory			...for a Class II facility	3.01	10%
...in or as a classroom	1.40	None	...for a Class III facility	2.26	10%
...all other [laboratory] laboratories	1.40	10%	...for a Class IV facility	1.50	10%
Laundry/Washing Area	0.60	10%	Transportation Facility		
Loading Dock, Interior	0.59	10%	...in a baggage/carousel area	1.00	10%
Lobby			...in an airport concourse	0.60	10%
...in a facility for the visually impaired (and used primarily by residents)	2.26	25%	...at a terminal ticket counter	1.50	10%
...for an elevator	0.80	25%	Warehouse – Storage Area		
...in a hotel	1.10	25%	...for medium to bulky, palletized items	0.90	45%
...in a motion picture theater	1.10	25%	...for smaller, hand-carried items	1.40	45%
...in a performing arts theater	3.30	25%			
...all other [lobby] lobbies	1.30	25%			
Locker Room	0.60	25%			
Lounge/Breakroom					
...in a healthcare facility	0.80	None			
...all other lounge/breakroom	1.20	None			
Office					
...enclosed	1.10	30%			
...open plan	1.10	15%			
Parking Area, Interior	0.20	15%			
Pharmacy Area	1.20	10%			
Restroom					
...in a facility for the visually impaired (and used primarily by residents)	1.52	45%			
...all other restroom	0.90	45%			
Sales Area	1.70	15%			
Seating Area, General	0.68	10%			
Stairwell	0.60	75%			
Storage Room					
...in a hospital	0.90	45%			
...that is ≥ 50 ft <sup>2</sup>	0.80	45%			
...that is < 50 ft <sup>2</sup>	0.80	45%			
Vehicular Maintenance Area	0.70	10%			
Workshop	1.90	10%			

- 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. For manual-ON or partial-auto-ON occupancy sensors, the occupancy sensor reduction factor shall be multiplied by 1.25.  
c. For occupancy sensors controlling individual workstation lighting, occupancy sensor reduction factor shall be 30%.