

**2007 Chapter 13 Lighting Provisions
With 2010 lighting proposals**

SECTION 1313
LIGHTING – OTHER BUILDINGS

1313.1 General. The provisions in this section apply to lighting equipment, related controls and electric circuits serving the interior spaces of other buildings, exterior building facades (including illuminated roofs and other architectural features), and exterior areas such as entrances, exits, loading docks, illuminated canopies, roads, open parking, exterior retail and landscaping.

Alterations to existing buildings shall comply with Section 1313.6.

Exceptions:

1. Lighting for the following areas:
 - 1.1. Outdoor athletic facilities.
 - 1.2. Dwelling units, lodging houses, one- or two family dwellings and guest rooms.
 - 1.3. Industrial plants—manufacturing spaces only.
 - 1.4. Paint shops and painting spray booths.
 - 1.5. High-risk security areas such as detention facilities, automatic teller machines (ATMs) and night drops.
 - 1.6. Areas specifically designed for visually disabled people.
 - 1.7. Tunnels.
2. Lighting equipment used for the following shall be exempt provided that it is in addition to general lighting and is controlled by an independent control device:
 - 2.1. Production lighting for theatrical, television, spectator sports and similar performance areas.
 - 2.2. Decorative, special effect and production lighting for those portions of entertainment facilities such as theme parks, nightclubs, discos and casinos, where lighting is an essential technical element for the function performed.
 - 2.3. Lighting equipment for sale.
 - 2.4. Task lighting for medical and dental purposes.
 - 2.5. Bench lighting for research laboratories.
 - 2.6. Lighting to be used solely for indoor plant growth during the hours of 10:00 p.m. to 6:00 a.m.
 - 2.7. Emergency lighting that is automatically off during normal building operation.
 - 2.8. Art accent lighting required for art exhibits or displays in galleries, museums and monuments.
 - 2.9. Sign lighting.
 - 2.10. Nonpermanent lighting.

1313.1.1 Additions and alterations.

Comment [m1]: Proposal OSSC10-21

1313.1.1.1 Additions. Lighting systems in all additions shall comply with the requirements of Section 1313.

1313.1.1.2 Alterations. The alteration of lighting systems in any building space or exterior area shall comply with the lighting power density (LPD) requirements of Section 1313.4 and 1313.5 applicable to that space or area. Such alteration shall include all luminaires that are added, replaced, or removed. This requirement shall also be met for alterations that involve just the lamps plus ballasts. Alterations do not include routine maintenance or repair.

Exception: Alterations that replace less than 10 percent of the connected lighting load in a space or area need not comply with these requirements provided that such alterations do not increase the LPD.

Any new lighting control devices that are installed shall comply with the requirements of Section 1313.3.

1313.2 Luminaire wattages. Lighting luminaire wattage subject to maximum connected lighting power allowed in this code shall be determined in the following manner:

1. Incandescent luminaires. The maximum rated lamp wattage permitted in the luminaire shall be the luminaire's wattage for the purpose of this standard.
2. Luminaire wattage shall be input wattages, including lamp and ballast losses, determined from values approved by the Building Codes Administrator. If a nonstandard product or system is used, ANSI input wattages shall be from the manufacturer's literature.
3. For compliance with this chapter, track lighting including lighting busway, monorail and cable systems and any other system permitting the movement of, relocation or changes to quantities of lighting fixtures by facility users shall be calculated at 50 watts per linear foot (123 W/m) of track or the volt-ampere (VA) rating of the branch circuit(s) feeding the tracks whichever is less.

Exception: For tracks employing in-line current-limiters or low-voltage transformers, the load of the track lighting is defined by the VA rating of the transformer or the VA rating of the in-line current-limiter.

1313.3 Lighting controls. All buildings with lighting equipment shall provide and install the controls described in Section 1313.3.

1313.3.1 Interior lighting controls. The following controls are required for interior lighted spaces:

1313.3.1.1 Local shutoff control. At least one local shutoff lighting control shall be provided for every 2,000 square feet (186 m²) of lit floor area and for all spaces enclosed by walls or ceiling height partitions.

Exceptions:

1. Lighting for warehouses, parking garages or spaces using less than 0.5 watts per square feet (5.4 W/m²).

2. Lighting systems serving areas that must be continuously lit.
3. Public areas, such as concourses, with switches that are accessible only to authorized personnel.
4. Lighting for contiguous, single-tenant retail spaces.

1313.3.1.2 Automatic shutoff control. ~~All spaces~~ Buildings greater than 5,000 square feet (465 m²) and office occupancies over 2,000 square feet (186 m²) of contiguous floor area shall be equipped with separate automatic controls to shut off the lighting during unoccupied periods. Automatic controls shall be an occupancy sensor, time switch or other device capable of automatically shutting off lighting that complies with Section 1313.3.1.2.1 or 1313.3.1.2.2.

Comment [m2]: Proposal OSSC10-21

Offices less than 300 square feet (27.9 m²), meeting and conference rooms, and school classrooms shall be equipped with occupancy sensors that comply with Section 1313.3.1.2.1.

Exceptions:

1. Emergency and pathway lights as required by code that are automatically off during normal building operation. Egress and pathway lights that are normally ON during normal building operation shall, during unoccupied periods, be limited to five percent of the installed lighting power density as listed in Table 1313.4.1 or 1313.4.2 unless controlled by an occupancy sensor.
2. Where the lighting system is serving an area that must be continuously lit for 24-hour operation.
3. Display and accent lighting, located within 2 feet of a display window, including plug-in, track and display case lighting is exempt. ~~All other display and accent lighting shall be separately controlled~~ have automatic controls separate from the general lighting controls to turn off the lighting after business hours.
4. Switching for industrial or manufacturing process facilities as may be required for production.
5. 24-hour occupancy areas in Hospitals and laboratory spaces.
6. Areas in which medical or dental tasks are performed.
7. Mechanical and electrical equipment rooms.

1313.3.1.2.1 Occupancy sensors. Occupancy sensors shall be capable of automatically turning off all the lights in an area, no more than 30 minutes after the area has been vacated. Lighting fixtures controlled by occupancy sensors shall have a wall-mounted, manual switch capable of turning the lights on and off when the space is occupied.

1313.3.1.2.2 Automatic time switches. Automatic time switches shall have a minimum seven-day clock and be capable of being set for seven different day types per week and incorporate an automatic holiday “shut-off” feature, which turns off all loads for at least 24 hours and then resumes normally scheduled

operations. Automatic time switches shall also have program back-up capabilities, which prevent the loss of program and time settings for at least 10 hours, if power is interrupted.

Automatic time switches shall incorporate an override switching device that:

1. Is readily accessible;
2. Is located so that a person using the device can see the effects of the control;
3. Is manually operated;
4. Allows the lighting to remain on for no more than 2 hours when an override is initiated; and
5. Controls an area not exceeding 2,000 ft² (186m²).

1313.3.1.3 Daylighting controls. Daylighting controls ~~meeting the requirements of this section~~ shall be required for all classrooms and atriums spaces meeting the requirements of this section.

Comment [m3]: Proposal OSSC10-21

1313.3.1.3.1 Daylighting requirements for windows. Classrooms and atriums with a window to exterior wall ratio of 50 percent or greater shall use automatic daylight sensing controls for all permanently installed luminaries located within a distance equal to the ceiling height ~~15 feet (4572 mm)~~ inward and from the wall that the window is located and ~~5 feet (1524 mm)~~ on each side of the windows. For the purpose of this section, the window-to-wall ratio is measured on the inside room of the exterior walls.

Comment [m4]: Proposal OSSC10-21

1313.3.1.3.2 Daylighting requirements for skylights. In all areas ~~classrooms and atriums~~ with skylights, monitors or other fenestration at or above ceiling level, all permanent luminaries within an area equal to the footprint of the ceiling opening plus 70 percent of the floor-to-ceiling height in each direction outward from the edge of the opening, shall be controlled by automatic daylight sensing controls.

Comment [m5]: Proposal OSSC10-21

1313.3.1.3.3 Automatic daylight sensing controls. When required by this section, automatic daylight sensing controls shall:

Comment [m6]: Proposal OSSC10-21

1. Be capable of reducing the light output of the controlled luminaries by at least one-half, with an OFF control, by switching or continuous dimming while maintaining a uniform level of illuminance; Non-continuous dimming devices shall have an adjustable separation/deadband of on-and-off points to prevent short-cycling, and
2. ~~Provide continuous dimming of the controlled luminaries;~~
3. Control only luminaires within the daylight area; and
4. Incorporate time-delay circuits to prevent cycling of light level changes of less than 3 minutes.

Exception: Atriums may utilize step switching or other noncontinuous dimming devices provided they have adjustable separation (deadband) of on and off points to prevent short cycling.

1313.3.2 Exterior and canopy lighting controls. All exterior lighting systems, including those attached to building exterior surfaces, mounted onto or in adjacent structures, attached to poles or mounted onto or in the ground, shall be controlled by photoelectric switches, clock switches or both, which shall be designed and programmed to extinguish lights when daylight is present. Clock switches shall be of an astronomic (seasonal correcting) type with separate programs for each day of the week and shall store energy to maintain timekeeping during power outages.

A motion sensor, if used, shall employ a photoelectric switch to prevent operation during the daytime.

1313.4 Interior connected lighting power. The interior connected lighting power shall not exceed the interior power allowance established in either Section 1313.4.1 or 1313.4.2.

Where multiple, independently operating lighting systems serve the same space and are controlled to prevent simultaneous operation, the connected lighting power shall be based on the system with the highest connected lighting power.

1313.4.1 Tenant space power allowance method. The total interior connected lighting power shall not exceed the maximum power allowance calculated by multiplying the lighting power density(ies) from Table 13-G **1313.4.1** based on the predominant use by the floor area of the entire tenant space or building. Parking garages and exterior canopies shall be treated separately from the building for the purposes of calculating interior connected lighting power.

Comment [m7]: Proposal OSSC10-21

1313.4.2 Space-by-space method. The total interior connected lighting power shall not exceed the maximum power allowance calculated by multiplying the lighting power density from Table 13-H **1313.4.2** for each space by the floor area of that space. Parking garages and exterior canopies shall be treated separately from the building for the purposes of calculating interior connected lighting power.

Comment [m8]: Proposal OSSC10-21

1313.4.2.1 Additional lighting power for retail displays.

1313.4.2.1.1 Additional lighting power for retail displays. For retail display lighting that is specifically directed to highlight retail merchandise and controlled separately from the space general light system, an additional lighting power allowance shall be calculated as follows:

Comment [m9]: Proposal OSSC10-21

For lighting equipment installed in retail sales area that is specifically designed and directed to highlight merchandise, one of the following may apply:

- 1. 0.6 watts per square foot of sales floor area not listed in 2 or 3 below,**
- 2. 1.4 watts per square foot of furniture, clothing, cosmetics or artwork floor area, or**

3. 2.5 watts per square foot of jewelry, crystal, or china floor area.

Additional Lighting Power for Retail Displays = 1.75 watts/ft² multiplied by area of retail floor space (ft²) up to a maximum of 17,500 watts.

The specified floor area for 1,2, or 3 above, and the adjoining circulation paths shall be identified and specified on the building plans. Calculate the additional power allowance by multiplying the above LPDs by the sales floor area for each department excluding major circulation paths. The total additional lighting power allowance is the sum of allowances sales categories, 1, 2, or 3 plus an additional 1,000 watts for each separate tenant larger than 250 square feet in area.

This additional lighting power shall only be used for retail display lighting in the applicable space, and shall not be used to increase lighting power allowance with other spaces or general lighting system within the space **and shall be controlled separately from the space general lighting system.**

1313.5 Exterior lighting. No **120 volt** incandescent or mercury vapor lighting sources shall be used for exterior building lighting. **The total exterior lighting power allowance for all exterior building applications is the sum of the base site allowance plus the individual allowances for areas that are designated on the building plans to be illuminated and are permitted in Table 1313.5(1) for the applicable Lighting Zone. Trade-offs are allowed only among exterior lighting applications listed in Table 1313.5 (1), Tradable Surfaces section. The lighting zone for building exterior is determined from Table 1313.5(2) unless otherwise specified by the local jurisdiction.**

Comment [m10]: Proposal OSSC10-22

Exception: Lighting used in or around swimming pools, water features, or other locations subject to the requirements of Article 680 of the *National Electrical Code*.

1313.6 Additions and alterations. Lighting systems in additions and alterations shall comply with the provisions of Section 1313.

Comment [m11]: Proposal OSSC10-21

Exception: Alterations to existing lighting systems that do not replace more than 50 percent of the luminaries in the permitted project and do not increase the existing total connected lighting power.

TABLE 13-G-1313.4.1

TENANT SPACE METHOD MAXIMUM ALLOWABLE LIGHTING POWER DENSITY (LPD)[†]

TENANT OR BUILDING TYPE [†]	LIGHTING POWER DENSITY (W/ft) [†]
Automotive Facility	0-9 0.79
Convention Center	1-2 1.16
Court House	1-2 1.08
Dining: Bar Lounge/Leisure	1-3 1.19
Dining: Cafeteria/Fast Food	1-4 1.34
Dining: Family	1.5
Exercise Center	1-0 0.92
Fire Station	0-8 0.74
Gymnasium	1-1 1.07

Comment [m12]: Proposal OSSC10-21

Healthcare – Clinic	1.0	<u>0.89</u>
Hospital	1.2	<u>1.08</u>
Hotel ²	1.0	
Library	1.3	<u>1.13</u>
Manufacturing Facility, Nonprocess Areas	1.3	<u>1.24</u>
Motel ²	1.0	
Motion Picture Theatre	1.2	<u>1.18</u>
Multifamily ²	0.7	<u>0.58</u>
Museum	1.1	<u>1.04</u>
Office	1.0	<u>0.91</u>
Parking Garage	0.3	<u>0.26</u>
Performing Arts Theater	1.6	<u>1.46</u>
Police Station	1.0	<u>0.89</u>
Post Office	1.1	<u>0.98</u>
Religious Building	1.3	<u>1.18</u>
Retail	1.5	<u>1.32</u>
School/University	1.1	<u>1.01</u>
Service station canopies, including all types of vehicle fueling and service (except enclosed garages)	2.0	
Sports Arena Complex	1.1	<u>1.03</u>
Town Hall	1.0	<u>0.94</u>
Transportation	1.0	<u>0.85</u>
Warehouse	0.8	<u>0.73</u>
Workshop	1.4	<u>1.2</u>

Comment [m13]: Proposal OSSC10-22

For SI: 1 foot = 304.8 mm, 1 square foot = 0.929 m², W/m² = W/ft² × 10.764

- Attached canopies shall be included in the total building or tenant power allowance. **The watts per square foot may be increased by 2 percent per foot of ceiling height above 20 feet.**
- Dwelling units and guestrooms are exempt from interior lighting power allowance requirements.
- Spaces used specifically for manufacturing process are exempt and shall not be included in the lighting power allowance calculations.

TABLE 13-1 **1313.4.2**
SPACE-BY-SPACE METHOD MAX. ALLOWABLE LIGHTING POWER DENSITY (LPD)

Common Space Types	LPD (W/ft ²) ¹	Building Specific Space Types (cont'd)	LPD (W/ft ²) ¹
Office-enclosed ²	1.0 <u>0.97</u>	Gymnasium/Exercise Center	
Office-open plan ²	1.0 <u>0.93</u>	Playing Area	1.4 <u>1.35</u>
Conference/Meeting/Multipurpose ³	1.3 <u>1.11</u>	Exercise Area	0.9 <u>0.79</u>
Classroom/Lecture/Training	1.4 <u>1.23</u>	Fire Stations	
Lobby	1.3 <u>1.28</u>	Fire Station Engine Room	0.8 <u>0.64</u>
For Hotel	1.1	Sleeping Quarters	0.3
For Performing Arts Theater	3.3 <u>3.24</u>	Post Office-Sorting Area	1.2 <u>1.05</u>
For Motion Picture Theater	1.1 <u>1.01</u>	Convention Center – Exhibit Space ³	1.3
Audience/Seating Area	0.9 <u>0.84</u>	Library ²	
For Gymnasium	0.4	Card File & Cataloging	1.1 <u>0.96</u>
For Exercise Center	0.3 <u>0.27</u>	Stacks	1.7 <u>1.47</u>
For Convention Center	0.7	Reading Area	1.2 <u>1.09</u>
For Religious Buildings	1.7 <u>1.60</u>	Hospital	
For Sports Arenas Complex	0.4	Emergency	2.7 <u>2.34</u>
For Performing Arts Theater	2.6 <u>2.52</u>	Recovery	0.8 <u>0.74</u>
For Motion Picture Theater	1.2 <u>1.11</u>	Nurse Station	1.0 <u>0.88</u>
For Transportation	0.5 <u>0.46</u>	Exam/Treatment	1.5 <u>1.31</u>
Atrium-first three floors	0.6	Pharmacy	1.2 <u>0.99</u>

Comment [m14]: Proposal OSSC10-21

Atrium-each additional floors	0.20 1.16	Patient Room	0.70 1.59
Lounge/Recreation	1.21 1.16	Operating Room	2.21 1.92
For Hospital	0.80 0.71	Nursery	0.60 0.48
Dining Area ²		Medical Supply	4.41 1.23
For Hotel/Motel	4.31 1.23	Physical Therapy	0.90 0.80
For Bar Lounge/Leisure Dining	1.4	Radiology	0.40 0.35
For Family Dining	2.1	Laundry-Washing	0.60 0.52
Food Preparation	4.21 1.07	Automotive – Service/Repair	0.70 0.63
Laboratory	1.4	Museum	
Restrooms	0.90 0.82	General Exhibition	1.0
Dressing/Locker/Fitting Room	0.60 0.52	Restoration	4.71 1.58
Corridor/Transition	0.50 0.41	Bank/Office – Banking Activity Area	4.51 1.31
For Hospital	1.00 0.94	Religious Buildings	
For Manufacturing Facility	0.50 0.41	Worship-pulpit, choir	2.42 2.29
Stairs-active	0.60 0.49	Fellowship Hall	0.90 0.81
Active Storage	0.80 0.66	Retail	1.5
For Hospitals	0.90 0.79	— Grocery Sales Area	2.0
Inactive Storage	0.30 0.26	— Jewelry, China & Art Sales Area	3.5
For Museum	0.80 0.66	— Other Merchandise Sales Area	2.0
Electrical/Mechanical	1.51 1.24	Mall Concourse	1.5
Workshop ⁴	1.91 1.64	Fitting Room	1.06
		Sports Arena Complex	
		Ring Sports Area	2.7
		Court Sports Area	2.32 2.0
		Indoor Plying Field Area	1.41 1.35
		Warehouse	
Building Specific Space Types		Fine Material Storage	1.41 1.24
Canopies		Medium/Bulky Material Storage	0.90 0.81
Under 15 feet in height	1.5	Parking Garage – Garage Area	0.2
15 feet and over in height	2.0	Transportation	
Courthouse/Police Station		Airport - Concourse	0.60 0.57
Courtroom	1.91 1.78	Air/Train/Bus – Baggage Area	1.00 0.89
Judges Chambers	1.31 1.18	Terminal – Ticket Counter	4.51 1.31

Comment [m15]:

Comment [m16]: Proposal OSSC10-22

Comment [m17]: Proposal OSSC10-22

For SI: 1 foot = 304.8 mm, 1 square foot = 0.929 m², W/m² = W/ft² X 10.764

¹ Spaces used specifically for manufacturing are exempt. The watts per square foot may be increased by 2 percent per foot of ceiling height above 20 feet unless specified differently by another footnote.

² The watts per square foot of room may be increased by 2 percent per foot of ceiling height above 9 feet.

³ Hotel banquet room, conference rooms, or exhibit hall watt per square foot of room may be increased by 2 percent per foot of ceiling height above 12 feet.

⁴ Spaces used specifically for manufacturing are exempt.

**TABLE 1313.5 (1)
EXTERIOR POWER ALLOWANCE**

Specific Area Description	Zone 1	Zone 2	Zone 3	Zone 4
Base Site Allowance¹	500 W	600 W	750 W	1300 W
Tradeable Surfaces²				
Uncovered Parking Areas	0.04 W/ft²	0.06 W/ft²	0.10 W/ft²	0.13 W/ft²
Building Grounds				
Parking areas and drives	0.04 W/ft²	0.06 W/ft²	0.10 W/ft²	0.13 W/ft²
Walkways <10' wide	0.7 W/lin ft	0.7 W/lin ft	0.8 W/lin ft	1.0 W/lin ft
Walkways >10' wide, plaza areas, Special feature areas	0.14 W/lin ft	0.14 W/lin ft	0.16 W/lin ft	0.2 W/lin ft
Exterior stairways	0.75 W/ft²	1.0 W/ft²	1.0 W/ft²	1.0 W/ft²
Pedestrian tunnel	0.15 W/ft²	0.15 W/ft²	0.2 W/ft²	0.3 W/ft²
Landscaping	0.04 W/ft²	0.05 W/ft²	0.05 W/ft²	0.05 W/ft²
Building Entrances and Exits				
Main entries	20 W/lin ft	20 W/lin ft	30 W/lin ft	30 W/lin ft
Door width	Door width	Door width	Door width	Door width
Other doors	20 W/lin ft	20 W/lin ft	20 W/lin ft	20 W/lin ft
Door width	Door width	Door width	Door width	Door width
Entry canopies	0.25 W/ft²	0.25 W/ft²	0.4 W/ft²	0.4 W/ft²
Sales Canopies				
Free standing and attached	0.6 W/ft²	0.6 W/ft²	0.8 W/ft²	1.0 W/ft²
Outdoor sales				
Open areas³	0.25 W/ft²	0.25 W/ft²	0.5 W/ft²	0.7 W/ft²
Street frontage and vehicle sales lots in addition to "open area" allowance	No Allowance	10 W/lin ft	10 W/lin ft	30 W/lin ft
Non-tradeable Surfaces⁴				
Building Facades	No Allowance	0.1 W/ft² for each illuminating wall or surface⁵	0.15 W/ft² for each illuminating wall or surface⁵	0.2 W/ft² for each illuminating wall or surface⁵
Automated Teller Machines and Night Depositories	270 W per location⁸	270 W per location⁸	270 W per location⁸	270 W per location⁸
Entrances & Gatehouse Inspection Stations – guarded facilities	0.75 W/ft² of covered & uncovered area	0.75 W/ft² of covered & uncovered area	0.75 W/ft² of covered & uncovered area	0.75 W/ft² of covered & uncovered area
Loading areas for Law Enforcement, Fire, Ambulance & other Emergency Service Vehicles	0.5 W/ft² of covered & uncovered area	0.5 W/ft² of covered & uncovered area	0.5 W/ft² of covered & uncovered area	0.5 W/ft² of covered & uncovered area
Drive-Up Windows and Doors	400 W per main entry	400 W per main entry	400 W per main entry	400 W per main entry
Parking near 24-hr Retail Entrances	800 W per main entry	800 W per main entry	800 W per main entry	800 W per main entry

For SI: 1 foot = 304.8 mm, 1 square foot = 0.929 m², W/m² = W/ft² x 10.764.

¹ Base site allowance may be used in tradable or non-tradable surfaces.

² Lighting power densities for uncovered parking areas, building grounds, building entrances and exits, canopies and overhangs and outdoor sales areas may be traded.

³ Including vehicle sales lots.

⁴ Lighting power density calculations for the following applications can be used only for the specific application and cannot be traded between surfaces or with other exterior lighting. The following allowances are in addition to any allowance otherwise permitted in the "tradeable surfaces" section of this table.

⁵ May alternately use 2.5 watts per linear foot for each wall or surface length.

⁶ May alternately use 3.75 watts per linear foot for each wall or surface length.

⁷ May alternately use 5 watts per linear foot per wall or surface length.

⁸ An additional 90 watts is allowed per additional ATM location.

TABLE 1313.5 (2)
ETERIOR LIGHTING ZONES

<u>Lighting Zone</u>	<u>Description</u>
<u>1</u>	<u>Developed areas of National Parks, State Parks, Forest</u>
<u>2</u>	<u>Areas predominately consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed area</u>
<u>3</u>	<u>All other areas</u>
<u>4</u>	<u>High activity commercial districts in major metropolitan areas as designated by the local jurisdiction</u>