Codes and Standards Enhancement (CASE) Initiative

2019 California Building Energy Efficiency Standards

Indoor Lighting Power Densities – Results Report

Measure Number**:** 2019-NR-LIGHT2-F

Nonresidential Lighting

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1. INTRODUCTION

The Codes and Standards Enhancement (CASE) initiative presents recommendations to support California Energy Commission's (Energy Commission) efforts to update California's Building Energy Efficiency Standards (Title 24, Part 6) to include new requirements or to upgrade existing requirements for various technologies. The Statewide CASE Team consists of the four California Investor Owned Utilities (IOUs) – Pacific Gas and Electric Company, San Diego Gas and Electric, Southern California Edison, and SoCalGas® – and two Publicly Owned Utilities (POUs) – Los Angeles Department of Water and Power and Sacramento Municipal Utility District – which sponsored this effort. The program goal is to prepare and submit proposals that will result in cost-effective enhancements to improve energy efficiency and energy performance in California buildings to the Energy Commission, the state agency that has authority to adopt revisions to Title 24, Part 6. The Energy Commission evaluates proposals submitted by the Statewide CASE Team and other stakeholders and may revise or reject proposals.

In September 2017, the Statewide CASE Team submitted the CASE Report that is presented in Attachment 1 to recommend code changes related to indoor lighting power densities. This document explains the revisions that occurred to the proposed code changes between the submittal of the Final CASE Report to the Energy Commission and the Energy Commission's adoption of the 2019 Title 24, Part 6 Standards on May 9, 2018. The document begins with a concise description of the adopted code language, followed by the estimated energy savings of the adopted requirements, with the remainder of the document outlining the evolution of the code changes and the final adopted language.

2. MEASURE DESCRIPTION

The adopted measure uses light emitting diodes (LEDs) as the basis for calculating allowable lighting power densities (LPDs) values (watts of lighting per square foot of room floor area) for all interior applications where technically feasible. LED technology continues to advance rapidly while costs continue to decline. As a result, the interior lighting market is experiencing increased adoption of LED light sources, and this trend is expected to continue. The adopted changes for this measure impact prescriptive lighting power allowances and the mandatory installed wattage calculation methods.

The primary adopted changes in this measure updated the allowed indoor lighting power densities based on currently existing cost-effective LED luminaires. The changes are based on LED sources that have correlated color temperatures and color rendering indexes comparable to legacy light sources, so that lighting color and fidelity are maintained. The Statewide CASE Team was committed to recommending code changes that would not compromise light quality or increase glare or exclude color-tuning systems. The new LPD requirements continue to enable adequate light levels to be achieved.

The adopted code language includes provisions for use-it-or-lose-it additional LPDs to ensure that there is sufficient light for task work, display, and ornamental lighting. There are also additional wattage allowances for a number of special needs and capabilities. For example, additional lighting wattage is allowed for providing extra light to areas occupied by the elderly or people who are visually impaired.

Indoor lighting systems comply with the building energy efficiency standards when their adjusted indoor lighting power is less than or equal to the allowed indoor lighting power. The adjusted indoor lighting power is the installed wattage of the indoor lighting system after being adjusted for:

- Interlocked lighting systems;
- Advanced controls;

- Excluded lighting power;
- Small aperture color tuning luminaires; and
- Tailored Method display luminaires mounted higher than 11 feet.

The Statewide CASE Team was aware of stakeholders' requests to revise the standards to allow the use of screw-base LED lamps without a wattage penalty. Some lighting alterations projects depend on the allowance of screw-base LED lamps; however, Title 24, Part 6 previously did not provide a way to claim the actual maximum rated wattage of screw-base LED replacement lamps when calculating LPDs in nonresidential spaces. The Statewide CASE Team was also aware that the previous current limiter[1] allowance was potentially penalizing the usage of LEDs in track lighting. The adopted measure removes existing language that discourages the use of screw-base LED lamps and addresses the current limiter issue by eliminating the alternate minimum watts per linear foot of track when a current limiter is used. This now aligns with how ASHRAE 90.1-2016 treats current limiters.

Finally, the Statewide CASE Team simplified the code language through the recommended revisions to Sections 110.9, 130.0, and 140.6. Table 1 identifies sections of the Standards and Reference Appendices that were modified as a result of advocacy activities. The table also identifies if the compliance software will be updated.

Table 1: Scope of Code Change Proposal

Measure Name	Type of Requirement	Modified Section(s) of Title 24, Part 6	Modified Title 24, Part 6 Appendices	Will Compliance Software Be Modified	Modified Compliance Document(s)
Modified LPDs	Prescriptive	Section 140.6(c)	N/A	Yes	NRCC-LTI-01, NRCC-LTI-03, NRCC-LTI-05
Accommodating color tuning	Prescriptive	Section 140.6(a) and 140.6(c)	N/A	Yes	NRCC-LTI-01, NRCC-LTI-03, NRCC-LTI-05
Streamlined lighting power	Mandatory	Section 130.0(c), 110.9(c), and 110.9(d)	NA7.7.3	Yes	NRCC-LTI-01, NRCC-LTI-05, NRCI-LTI-01, NRCI-LTI-03-E

3. STATEWIDE ENERGY IMPACTS OF ADOPTED REQUIREMENTS

Error! Reference source not found. shows the estimated energy savings of the adopted requirements o ver the first twelve months that are in effect. The first-year savings have not changed since submitting the Final CASE Report.

[1] Current limiters are devices installed onto track lighting rails and are used to ensure additional lamps are not installed by reducing the amount of wattage a lighting track can support. There are other types of current limiting devices that perform the same task, but are not installed onto track lighting rails.

Table 2: Estimated Statewide First Year[a] Energy and Water Savings

Measure	First Year Electricity Savings (GWh/yr)	First Year Peak Electrical Demand Reduction (MW)	First Year Water Savings (million gallons/yr)	First Year Natural Gas Savings (million therms/yr)
LPDs (Total)	**368.0**	**50.7**	N/A	N/A
New Construction	94.2	13.0	N/A	N/A
Alterations	273.8	37.7	N/A	N/A

a. First year savings from all buildings completed statewide in 2020.

4. EVOLUTION OF CODE REQUIREMENTS

The Statewide CASE Team submitted the final version of the CASE Report to the Energy Commission during September 2017. The Final CASE Report addresses input that was received during utility-sponsored stakeholder meetings held on September 8, 2016, and March 22, 2017, and during the Energy Commission's pre-rulemaking workshop that was held on June 22, 2017. This section describes how the code change proposal evolved between the time Final CASE Report was submitted to the Energy Commission and the time the standards were adopted.

4.1 Use-it-or-lose-it Wattage Adder

The Statewide CASE Team proposed to update the definition for Ornamental Lighting to update "light color panels" to "luminous panels," for decorative luminaires, and to include architectural luminaires within the definition to allow the use-it-or-lose-it wattage adder to apply to architectural wall washing luminaires. These updates were not included in the Energy Commission's Express Terms, 45-Day Language, or 15-Day Language despite the Statewide CASE Team's recommendation to include them. Ultimately, the Energy Commission did not include this update in the adopted language.

The Energy Commission removed a number of the proposed wattage adder footnotes to the Area Category Method (Table 140.6-C) that were included in the Final CASE Report. The Statewide CASE Team proposed adding the footnotes back in, however, some were extraneous or unused. Additionally, the removal of the footnotes shortened and simplified the language, so the Statewide CASE Team was okay with them not being part of the adopted language.

4.2 Editorial Revisions and Other Minor Changes

4.2.1 Differences in Building Area Names

The LPDs adopted by the Energy Commission matched the LPDs presented in the Statewide CASE Team's Final CASE Report. However, the Energy Commission did not adopt every proposed name for spaces in the Table 140.6-B (Complete Building Method) nor in Table 140.6-C (Area Category Method). The Statewide CASE Team was not concerned with these differences and did not pursue updating the names.

4.2.2 Power-over-Ethernet

Power-over-Ethernet (PoE) systems presented unique concerns over compliance enforcement. The Statewide CASE Team presented two compliance options to the Energy Commission for consideration in the Final CASE Report. Each compliance option held enforcement advantages and disadvantages. Ultimately, the Energy Commission chose language similar to the Statewide CASE Team's second option: the wattage rating of PoE is the total power rating of the system minus wattage of connected

non-lighting devices. The Energy Commission inserted the language as an exception with the same intent as the language proposed in the Final CASE Report.

4.2.3 Track Lighting and Current Limiters

The Statewide CASE Team proposed to remove language on current limiter requirements in Section 110.9, to simplify the language. The Energy Commission initially removed the language completely in the Express Terms, but reinserted substantially shortened language for the requirement into Section 110.9 in the 45-Day Language. While not completely matching the Statewide CASE Team's proposed removal of the language, the final adopted language still simplifies the language. The Energy Commission also used the Statewide CASE Team's proposed update to track lighting wattage from 45 to 30 watts per linear foot when no current limiter is used. The adopted language for determining wattage with current limiters also closely resembles the proposed language from the Final CASE Report.

5. ADOPTED CODE LANGUAGE

The adopted code language for the Standards and Reference Appendices are presented in the following sections. Additions to the 2016 Title 24, Part 6 code language are underlined and deletions are ~~struck~~.

5.1 Building Energy Efficiency Standards

5.1.1 Section 100.1 – Definitions and Rules of Construction

Dining Areas include the following:~~is a room or area where meals that are served to the customers will be consumed.~~

Bar/Lounge and Fine Dining: Bar/Lounge is a room or area with wait staff serve patrons with~~s~~ liquor, cocktails, wine and beer in a relaxed atmosphere, usually with tables and chairs.

Fine Dining is a room or area with wait staff serve patrons with meals ~~and~~in an elegant and formal atmosphere.

Cafeteria/Fast Food is a room or area where customers pick up their food at a counter and there is little or no wait staff or table service.

Family Dining is a room or area with wait staff serve patrons with meals in a causal atmosphere.

Commercial and Industrial Storage Area includes the following:~~is a room or area used for storing of items such as goods and merchandise.~~

Warehouse is a room or areas used for storing of items such as goods, ~~and~~ merchandise and materials.

Shipping & Handling is a room or areas used for packing, wrapping, labelling and shipping out goods, ~~and~~ merchandise and materials.

Healthcare Facilities may have a room or area as follows:

Exam/Treatment Room is a room or area that does not provide overnight patient care and that is used to provide physical and mental care through medical, dental, or psychological examination and treatment, including laboratories and treatment spaces.

Imaging Room is a diagnostic room and area for application and review of results from imaging technologies including x-ray, ultrasound, computerized tomography (CT), and magnetic resonance imaging (MRI).

Medical Supply Room is a room or area used for storing medical supplies.

Nursery is a room or area for providing medical care for newly born infants.

Nurse's Station is a room or area where health care staff work when not directly interacting with patients.

Operating Room is a room or area where surgical operations are carried out in a sterile environment. This category also applies to veterinary operating rooms.

Patient Room is a room or area that occupied by one or more patients during a stay in a healthcare facility or hospital.

Physical Therapy Room is a room or area for providing physical therapy treatment.

Recovery Room is a room or area which is equipped with apparatus for meeting postoperative emergencies and in which surgical patients are kept during the immediate postoperative period for care and recovery from anesthesia.

~~**Laboratory, Scientific** is a room or area where research, experiments, and measurement in medical and physical sciences are performed requiring examination of fine details. The area may include workbenches, countertops, scientific instruments, and associated floor spaces. Scientific laboratory does not refer to film, computer, and other laboratories where scientific experiments are not performed.~~

Scientific Laboratory Area is a room or area where research, experiments, and measurement in medical and physical sciences are performed requiring examination of fine details. The area may include workbenches, countertops, scientific instruments, and associated floor spaces. Scientific laboratory does not refer to film, computer, and other laboratories where scientific experiments are not performed.

Lounge/Breakroom or Waiting Area is a room or area in ~~a public place such as a hotel, airport, club, or bar, designated for~~which people ~~to~~ sit, wait and relax.

Multipurpose Room is a room which can be used for multipurpose activities such as meetings, instructional activities and social gatherings. Multipurpose rooms are typically found in offices, schools, convention centers, and assisted living facilities.

Multipurpose Room is a room which can be used for multipurpose activities such as meetings, instructional activities and social gatherings. Multipurpose rooms are typically found in offices, schools, convention centers, and assisted living facilities.

Performance Arts Theater Building is a building with building floor areas used for showing performing arts that include plays, music or dance to audiences.

NONRESIDENTIAL BUILDING OCCUPANCY TYPES are building types in which a minimum of 90 percent of the building floor area functions as one of the following, which do not qualify as any other Building Occupancy Types more specifically defined in Section 100.1, and which do not have a combined total of more than 10 percent of the area functioning of any Nonresidential Function Areas specifically defined in Section 100.1:

~~**Auditorium**~~ **Assembly Building** is a ~~public~~ building with meeting halls in which people gather for civic, social, or recreational activities. These include civic centers, convention centers and auditoriums ~~a minimum of 90 percent of the building floor area are rooms with fixed seating that are primarily used for public meetings or gatherings~~.

Ornamental Lighting for compliance with Part 6 is the following:

Luminaires installed outdoor which are rated for ~~100~~ 30 watts or less that are post-top luminaires, lanterns, pendant luminaires, chandeliers, and marquee lighting, not providing general lighting or

task lighting.

Retail Store Building is a building with building floor areas used for the display and sale of merchandise except food.

Retail Sales Areas include the following:

Fitting Room is a room or area that the retail customers try out clothing before purchasing.

Solid State Lighting (SSL) is a family of light sources that includes: semiconductor light emitting diodes (LEDs); and organic light emitting diodes (OLEDs).

Driver, when used in relation to solid state lighting, is a device that uses semiconductors to control and supply dc power for LED starting and operation.

Sports Arena Building is a building with building floor areas used for public viewing of sporting events and activities. Sports arenas are classified according to the number of spectators they are able to accommodate, as follows:

Class I Facility is used for competition play for 5000 or more

spectators. Class II Facility is used for competition play for up to

5000 spectators. Class III Facility is used for competition play for

up to 2000 spectators.

Class IV Facility is normally used for recreational play and there is limited or no provision for spectators.

Transportation Function Areas include the following: ~~is the ticketing area, waiting area, baggage handling areas, concourse, in an airport terminal, bus or rail terminal or station, subway or transit station, or a marine terminal.~~

Baggage Area is a room or area in a transportation facility such as an airport where the travelers reclaim their baggage.

Ticketing Area is a room or area in a transportation facility such as an airport or a train station where travelers purchase tickets, check in baggage, or inquire about travel information.

5.1.2 Section 110.9 – Mandatory Requirements for Lighting Control Devices and Systems, Ballasts, and Luminaires

(c) **Track Lighting Integral Current Limiter.** An integral current limiter for line-voltage track lighting shall be recognized for compliance with Part 6 only if it meets all of the following requirements:

~~1. Shall be certified to the Energy Commission as meeting all of the applicable requirements in Section 110.9(c); and~~
~~2. Shall comply with the Lighting Control Installation requirements in accordance with Section 130.4; and~~
~~3. Shall be manufactured so that the current limiter housing is used exclusively on the same manufacturer's track for which it is designed; and~~
~~4. Shall be designed so that the current limiter housing is permanently attached to the track so that the system will be irreparably damaged if the current limiter housing were to be removed after installation into the track. Methods of attachment may include but are not limited to one-~~

~~way barbs, rivets, and one-way screws; and~~

~~5. Shall employ tamper resistant fasteners for the cover to the wiring compartment; and~~

~~6~~1. Shall have the identical volt-ampere (VA) rating of the current limiter, as installed and rated for compliance with Part 6 clearly marked as follows; and:

A. So that it is visible for the enforcement agency's field inspection without opening coverplates, fixtures, or panels; and

B. Permanently marked on the circuit breaker; and

C. On a factory-printed label that is permanently affixed to a non-removable base-plate inside the wiring compartment.

~~7~~2. Shall have a conspicuous factory installed label permanently affixed to the inside of the wiring compartment warning against removing, tampering with, rewiring, or bypassing the device; and

~~8~~3. Each electrical panel from which track lighting integral current limiters are energized shall have a factory printed label permanently affixed and prominently located, stating the following: "NOTICE: Current limiting devices installed in track lighting integral current limiters connected to this panel shall only be replaced with the same or lower amperage. Adding track or replacement of existing current limiters with higher continuous ampere rating will void the track lighting integral current limiter certification, and will require re-submittal of compliance documentation to the enforcement agency responsible for compliance with the California Title 24, Part 6 Building Energy Efficiency Standards."

(d) **Track Lighting Supplementary Overcurrent Protection Panel.** A Track Lighting Supplementary Overcurrent Protection Panel shall be used only for line-voltage track lighting and shall be recognized for compliance with Part 6 only if it meets all of the following requirements:

1. ~~Shall comply with the Lighting Control Installation requirements in accordance with Section 130.4; and~~

~~2~~1. Shall be listed as defined in Section 100.1; and

~~3. Shall be used only for line voltage track lighting. No other lighting or building power shall be used in a Supplementary Overcurrent Protection Panel used to determine input wattage for track lighting; and~~

~~4. Be permanently installed in an electrical equipment room, or permanently installed adjacent to the lighting panel board providing supplementary overcurrent protection for the track lighting circuits served by the supplementary over current protection pane; and~~

~~5~~2. Shall have a permanently installed label that is prominently located stating the following: "NOTICE: This Panel for Track Lighting Energy Code Compliance Only. The overcurrent protection devices in this panel shall only be replaced with the same or lower amperage. No other overcurrent protective device shall be added to this panel. Adding to, or replacement of existing overcurrent protective device(s) with higher continuous ampere rating, will void the panel listing and require re-submittal of compliance documentation to the enforcement agency responsible for compliance with the California Title 24, Part 6 Building Energy Efficiency Standards."

5.1.3 Section 130.0 – Lighting Systems and Equipment, and Electrical Power Distribution Systems - General

(a) The design and installation of all lighting systems and equipment in nonresidential, high-rise

residential, hotel/motel buildings, outdoor lighting, and electrical power distribution systems within the scope of Section 100.0(a) shall comply with the applicable provisions of Sections 130.0 through 130.5.

NOTE: The requirements of Sections 130.0 through 130.5 apply to newly constructed buildings. Section 141.0 specifies which requirements of Sections 130.0 through 130.5 also apply to additions and alterations to existing buildings.

(b) **Functional areas where compliance with ~~the~~ residential lighting ~~S~~standards is required.** The design and installation of all lighting systems, lighting controls, and equipment in the following functional areas shall comply with the applicable ~~provisions~~ residential lighting requirements of Section 150.0(k). In buildings containing these functional areas, all other functional areas, such as common areas, shall comply with the applicable nonresidential lighting ~~Standards~~ and ~~the applicable nonresidential~~ controlled receptacle requirements ~~in Section 130.5(d)~~.

1. High-rise residential dwelling units.
2. Outdoor lighting ~~that is~~ attached to a high-rise residential or hotel/motel building, and ~~is~~ separately controlled from the inside of a dwelling unit or guest room.
3. Fire station dwelling accommodations.
4. Hotel and motel guest rooms. Additionally, hotel and motel guest rooms shall meet the requirements of Section 130.1(c)8 and Section 130.5(d)4.
5. Dormitory and Senior housing dwelling accommodations.

NOTE: The requirements of Section 130.0(b) also apply to additions and alterations to functional areas of existing buildings as specified in Section 130.0(b).

(c) **Luminaire classification and power.** Luminaires shall be classified and their wattage determined as follows:

1. **~~Luminaire labeling.~~** Luminaire wattage shall be labeled as follows:

   A. The maximum ~~relamping~~ rated wattage or relamping rated wattage of a luminaire shall be listed on a permanent, preprinted, factory-installed label, as specified by UL 1574, 1598, 2108, or 8750, as applicable; and

   B.~~,~~ The factory-installed maximum ~~relamping~~ rated wattage or relamping rated wattage label shall not consist of peel-off or peel-down layers or other methods that allow the rated wattage to be changed after the luminaire has been shipped from the manufacturer.

   EXCEPTION to Section 130.0(c)1B: Peel-down labels may be used only for the following luminaires when they can accommodate a range of lamp wattages without changing the luminaire housing, ballast, transformer or wiring. Qualifying luminaires shall have a single lamp, and shall have integrated ballasts or transformers. Peel-down labels must be layered such that the rated wattage reduces as successive layers are removed.

      i. High intensity discharge luminaires, having an integral electronic ballast, with a maximum relamping rated wattage of 150 watts.

      ii. Low-voltage luminaires (except low voltage track systems), ≤ 24 volts, with a maximum relamping rated wattage of 50 watts.

      iii. Compact fluorescent luminaires, having an integral electronic ballast, with a

maximum relamping rated wattage of 42 watts.

2. For luminaires with line voltage lamp holders not containing permanently installed ballasts or transformers,; the wattage of such luminaires shall be determined as follows:

   A. The maximum rated wattage of the luminaire; and

   B. For recessed luminaires with line-voltage medium screw base sockets, wattage shall not be less than 50 watts per socket, or the rated wattage of the installed JA8 compliant lamps.

3. Luminaires and luminaire housings designed to accommodate a variety of trims or modular components that allow the conversion between incandescent and any other lighting technology without changing the luminaire housing or wiring shall be classified as incandescent.

4. Screwbased adaptors shall not be used to convert an incandescent luminaire to any type of nonincandescent technology. Screw-based adaptors, including screw-base adaptors classified as permanent by the manufacturer, shall not be recognized for compliance with Part 6.

5. Luminaires and luminaire housings with incandescent screw base sockets shall be classified only as incandescent. Field modifications, including but not limited to hard wiring of an LED module, shall not be recognized as converting an incandescent luminaire or luminaire housing to a nonincandescent technology for compliance with Part 6 unless such sockets are removed.

6. For Lluminaires with permanently installed or remotely installed ballasts, or drivers. Tthe wattage of such luminaries shall be determined as follows:

   A. The operating input wattage of the rated ballast or lamp/ballast combination shall be the operating input wattage of the rated lamp/ballast combination published in the ballast manufacturer's catalogs based on independent testing lab reports as specified by UL 1598.

   B. The maximum input wattage of the rated driver published in driver's manufacturer catalogs based on independent testing lab reports as specified by UL 8750 or LM-79.

4. For inseparable SSL luminaires and SSL luminaires with remotely mounted drivers, the maximum rated wattage shall be the maximum rated input wattage of the SSL luminaire as specified in Section 130.0(c)1 when tested in accordance with UL 1598, 2108, 8750, or IES LM-79.

75. For LED tape lighting and other LED linear lighting that do not require a luminaire housing with the installation with LED tape lighting components, the maximum rated wattage shall be the sum of the installed length of the tape lighting times its rated linear power density in watts per linear feet, or the maximum rated input wattage of the driver or power supply providing power to the lighting system, with tape lighting tested in accordance with UL 2108, 8750, or IES LM- 79,

6. Line-voltage lighting track and plug-in buswayFor modular lighting systems that allows the addition or relocation of luminaires without altering the wiring of the system., Tthe wattage of such luminaires shall be determined by one of the following methodsas follows:

   A. The wattage of line-voltage busway and track rated for more than 20 amperes shall be the total volt- ampere rating of the branch circuit feeding the busway and track.

   B. The wattage of line-voltage busway and track rated for 20 amperes or less shall be determined by one of the following methods:

      A. The wattage shall be the greater of:

         i. 30 watts per linear foot of track or plug-in busway; or

         ii. the rated wattage of all of the luminaires included in the system, where the

luminaire wattage is determined as specified in Section 130.0(c)1. ~~The volt-ampere rating of the branch circuit feeding the track or busway~~; or

~~ii. The higher of the rated wattage of all of the luminaires included in the system, where luminaire classification and wattage is determined according to the applicable provisions in Section 130.0(c), or 45 watts per linear foot; or~~

~~iii~~B. ~~When using a line-voltage track lighting integral current limiter,~~ For line-voltage lighting track and plug-in busway served by a track lighting integral current limiter or a dedicated track lighting supplementary overcurrent protection panel, the wattage shall be determined as follows:

i. The volt-ampere rating of current limiter as specified by UL 1077;

ii. The sum of the ampere (A) rating of all of the current protection devices times the branch circuit voltages for track lighting supplementary overcurrent protection panel ~~the higher of the volt- ampere rating of an integral current limiter controlling the track or busway, or 12.5 watts per linear foot of track or busway. An Integral current limiter shall be certified to the Energy Commission in accordance with Section 110.9, and shall comply with the Lighting Control Installation Requirements in accordance with Section 130.4, to qualify to use Subsection Biii to determine luminaire power~~; or

~~iv. When using a dedicated track lighting supplementary overcurrent protection panel, the rated power shall be the sum of the ampere (A) rating of all of the overcurrent protection devices times the branch circuit voltages. Track lighting supplementary overcurrent protection panels shall comply with the applicable requirements in Section 110.9, and shall comply with the Lighting Control Installation Requirements in accordance with Section 130.4, to qualify to use Subsection Biv to determine luminaire power.~~

C. For other modular lighting systems with power supplied by a driver, power supply or transformer, including but not limited to low-voltage lighting systems, the wattage of the system shall be the maximum rated input wattage of the driver, power supply or transformer published in the manufacturer's catalogs, as specified by UL 2108 or 8750

EXCEPTION to Section 130.0(c)6: For power-over-Ethernet lighting systems, power provided to installed non-lighting devices may be subtracted from the total power rating of the power-over-Ethernet system.

~~8. Luminaires and lighting systems with permanently installed or remotely installed transformers. The wattage of such luminaires shall be determined as follows:~~

~~A. For low-voltage luminaires that do not allow the addition of lamps, lamp holders, or luminaires without rewiring, the wattage shall be the rated wattage of the lamp/transformer combination.~~

~~B. For low-voltage lighting systems, including low voltage tracks and other low-voltage lighting systems that allow the addition of lamps, lamp holders, or luminaires without rewiring, the wattage shall be the maximum rated input wattage of the transformer, labeled in accordance with Item 1, or the maximum rated wattage published in transformer manufacturer's catalogs, as specified by UL 2108.~~

~~9. Light emitting diode (LED) Luminaires, and LED Light Engine.~~

A. The wattage of such luminaires shall be the maximum rated input wattage of the system when tested in accordance with IES LM-79-08.

B. The maximum rated input wattage shall be labeled in accordance with Section 130.0(c)1.

C. An LED lamp, integrated or nonintegrated type in accordance with the definition in ANSI/IES RP-16-2010, shall not be classified as a LED lighting system for compliance with Part 6. LED modules having screw bases, including but not limited to screw-based pig-tails, screw-based sockets, or screw-based adaptors, shall not be recognized as a LED lighting system for compliance with Part 6.

D. Luminaires manufactured or rated for use with low-voltage incandescent lamps, into which have been installed LED modules or LED lamps, shall not be recognized as a LED lighting system for compliance with Part 6.

E. For LED lighting systems that allow the addition of luminaires or light engines without rewiring, the wattage of such luminaires shall be the maximum rated input wattage of the power supply, labeled in accordance with Section 130.0(c)1 or published in the power supply manufacturer's catalog.

EXCEPTION to Section 130.0(c)9: Luminaires in areas that must comply with Section 150.0(k), as specified by Section 130.0(b).

1067.The wattage ofFor all other miscellaneous lighting equipment not addressed by Sections 130.0(c)2 through 6, the wattage of the lighting equipment shall be the maximum rated wattage of the lighting equipment, or operating input wattage of the system, labeled in accordance with Section 130.0(c)1, or published in manufacturer's catalogs, based on independent testing lab reports as specified by UL 1574, or UL 1598, 2108, 8750, or IES LM-79. Lighting technologies listed in Subsections 2 through 9 shall be determined in accordance with the applicable requirements in Subsections 1 through 9.

(d) **Lighting Controls**. All lighting controls and equipment shall comply with the applicable requirements in Sections 110.9, 130.1 and 130.2, and shall be installed in accordance with the any applicable manufacturer's instructions.

5.1.4 Section 130.4 – Lighting Control Acceptance and Installation Certificate Requirements

(a) **Lighting Control Installation Certificate Requirements.** To be recognized for compliance with Part 6 an Installation Certificate shall be submitted in accordance with Section 10-103(a) for any lighting control system, Energy Management Control System, track lighting integral current limiter, track lighting supplementary overcurrent protection panel, interlocked lighting system, lighting Power Adjustment Factor, or additional wattage available for a videoconference studio, in accordance with the following requirements, as applicable:

1. Certification that when a lighting control system is installed to comply with lighting control requirements in Part 6 it complies with the applicable requirements of Section 110.9; and complies with Reference Nonresidential Appendix NA7.7.1.

2. Certification that when an Energy Management Control System is installed to function as a lighting control required by Part 6 it functionally meets all applicable requirements for each application for which it is installed, in accordance with Sections 110.9, 130.0 through 130.5, 140.6 through 150.0, and 150.2; and complies with Reference Nonresidential Appendix NA7.7.2.

3. Certification that line-voltage track lighting integral current limiters comply with the applicable requirements of Section 110.9 and installed wattage has been determined in accordance with Section 130.0(c); and comply with Reference Nonresidential

~~Appendix NA7.7.3.~~RESERVED

4. ~~Certification that line-voltage track lighting supplementary overcurrent protection panels comply with the applicable requirements of Section 110.9 and installed wattage has been determined in accordance with Section 130.0(c); and comply with Reference Nonresidential Appendix NA7.7.4.~~RESERVED

5.1.5 Section 140.6 – Prescriptive Requirements for Indoor Lighting

A building complies with this section if:

i. The Calculation of ~~Actual~~ Adjusted Indoor Lighting Power of all proposed building areas combined, calculated under Subsection (a) is no greater than the Calculation of Allowed Indoor Lighting Power,
Specific Methodologies calculated under Subsection (c); and

ii. The Calculation of Allowed Indoor Lighting Power, General Rules comply with Subsection (b); and

iii. General lighting complies with the Automatic Daylighting Controls in Secondary Daylit Zone requirements in Subsection (d).

The prescriptive limits on indoor lighting power are the smaller of the Actual and Allowed Indoor Lighting Power values determined in accordance with item i.

(a) **Calculation of ~~Actual~~ Adjusted Indoor Lighting Power.** The ~~actual~~adjusted indoor Lighting Power of all proposed building areas is the total watts of all planned permanent and portable lighting systems in all areas of the proposed building; subject to the applicable adjustments under Subdivisions 1 through ~~3~~ 4 of this subsection ~~and the requirements of Subdivision 4 of this subsection~~.

~~EXCEPTION to Section 140.6(a):~~ ~~Up to 0.3 watts per square foot of portable lighting for office areas shall not be required to be included in the calculation of actual indoor Lighting Power.~~

1. **Two interlocked lighting systems**: No more than two lighting systems may be used for an area, and if there are two they must be interlocked. Where there are two interlocked lighting systems, the watts of the lower wattage system may be excluded from the ~~actual~~Adjusted ~~indoor~~ Indoor Lighting Power if:

   A. An Installation Certificate detailing compliance with Section 140.6(a)1 is submitted in accordance with Section 10-103 and Section 130.4; and

   B. The area or areas served by the interlocking systems is an auditorium, a convention center, a conference room, a multipurpose room, or a theater; and

   C. The two lighting systems are interlocked with a Nonprogrammable Double-Throw Switch to prevent simultaneous operation of both systems.

   For compliance with Part 6 a Nonprogrammable Double-Throw Switch is an electrical switch commonly called a "single pole double throw" or "three-way" switch that is wired as a selector switch allowing one of two loads to be enabled. It can be a line voltage switch or a low voltage switch selecting between two relays. It cannot be overridden or changed in any manner that would permit both loads to operate simultaneously.

2. **Reduction of wattage through controls.** In calculating ~~actual~~Adjusted ~~indoor~~ Indoor Lighting Power, the installed watts of a luminaire providing general lighting in an area listed in TABLE 140.6-A may be reduced by the product of (i) the number of watts controlled as

described in TABLE 140.6-A, times (ii) the applicable Power Adjustment Factor (PAF), if all of the following conditions are met:

A. An Installation Certificate is submitted in accordance with Section 130.4(b); and

B. Luminaires and controls meet the applicable requirements of Section 110.9, and Sections 130.0 through 130.5; and

C. The controlled lighting is permanently installed general lighting systems and the controls are permanently installed nonresidential-rated lighting controls.

When used for determining PAFs for general lighting in offices, furniture mounted luminaires that comply with all of the following conditions shall qualify as permanently installed general lighting systems:

i. The furniture mounted luminaires shall be permanently installed no later than the time of building permit inspection; and

i. The furniture mounted luminaires shall be permanently hardwired; and

ii. The furniture mounted lighting system shall be designed to provide indirect general lighting; and

iii. Before multiplying the installed watts of the furniture mounted luminaire by the applicable PAF,
0.3 watts per square foot of the area illuminated by the furniture mounted luminaires shall be subtracted from installed watts of the furniture mounted luminaires; and

iv. The lighting control for the furniture mounted luminaire complies with all other applicable requirements in Section 140.6(a)2.

D. At least 50 percent of the light output of the controlled luminaire is within the applicable area listed in TABLE 140.6-A. Luminaires on lighting tracks shall be within the applicable area in order to qualify for a PAF.

E. Only one PAF from TABLE 140.6-A may be used for each qualifying luminaire. PAFs shall not be added together unless allowed in TABLE 140.6-A.

F. Only lighting wattage directly controlled in accordance with Section 140.6(a)2 shall be used to reduce the ~~calculated actual indoor Lighting Power~~installed watts as allowed by Section 140.6(a)2 for calculating the Adjusted Indoor Lighting Power. If only a portion of the wattage in a luminaire is controlled in accordance to Section 140.6(a)2, then only that portion of controlled wattage may be reduced in calculating ~~actual~~ Adjusted Iindoor Lighting Power.

G. Lighting controls used to qualify for a PAF shall be designed and installed in addition to manual, multilevel, and automatic lighting controls required in Section 130.1, and in addition to any other lighting controls required by any provision of Part 6. PAFs shall not be available for lighting controls required by Part 6.

H. To qualify for the PAF for daylight dimming plus OFF control, the daylight control and controlled luminaires shall comply with Section 130.1(d), 130.4(a)3 and 130.4(a)7, and shall additionally turn lights completely OFF when the daylight available in the daylit zone is greater than 150 percent of the illuminance received from the general lighting system at full power. The PAF shall apply only to the luminaires in the primary sidelit daylit zone and the skylit daylit zone.

I. To qualify for the PAF for an occupant sensing control controlling the general lighting in

large open plan office areas above workstations, in accordance with TABLE 140.6-A, the following requirements shall be met:

i. The open plan office area shall be greater than 250 square feet; and

ii. This PAF shall be available only in office areas which contain workstations; and

iii. Controlled luminaires shall only be those that provide general lighting directly above the controlled area, or furniture mounted luminaires that comply with Section 140.6(a)2 and provide general lighting directly above the controlled area; and

iv. Qualifying luminaires shall be controlled by occupant sensing controls that meet all of the following requirements, as applicable:

a. Infrared sensors shall be equipped by the manufacturer, of fitted in the field by the installer, with lenses or shrouds to prevent them from being triggered by movement outside of the controlled area.

b. Ultrasonic sensors shall be tuned to reduce their sensitivity to prevent them from being triggered by movements outside of the controlled area.

c. All other sensors shall be installed and adjusted as necessary to prevent them from being triggered by movements outside of the controlled area.

J. To qualify for the PAF for an Institutional Tuning in TABLE 140.6-A, the tuned lighting system shall comply with all of the following requirements:

i. The lighting controls shall limit the maximum output or maximum power draw of the controlled lighting to 85 percent or less of full light output or full power draw; and

ii. The means of setting the limit is accessible only to authorized personnel; and

iii. The setting of the limit is verified by the acceptance test required by Section 130.4(a)7; and

iv. The construction documents specify which lighting systems shall have their maximum light output or maximum power draw set to no greater than 85% of full light output or full power draw.

K. To qualify for the PAF for a Demand Responsive Control in TABLE 140.6-A, a Demand Responsive Control shall meet all of the following requirements:

i. The building shall be 10,000 square feet or smaller; and

ii. The controlled lighting shall be capable of being automatically reduced in response to a demand response signal; and

iii. Lighting shall be reduced in a manner consistent with uniform level of illumination requirements in TABLE 130.1-A; and

iv. Spaces that are non-habitable shall not be used to comply with this requirement, and spaces with a lighting power density of less than 0.5 watts per square foot shall not be counted toward the building's total lighting power.

L. To qualify for the PAFs for clerestory fenestration, horizontal slats, or light shelves in TABLE 140.6-A, the daylighting design shall meet the requirements in Section 140.3(d). The PAFs shall only apply to lighting in a primary or secondary sidelit daylit zone where continuous dimming daylighting controls meeting the requirements of Section 130.1(d) are installed.

3. **Lighting wattage excluded.** The watts of the following indoor lighting applications may be excluded from ~~actual indoor~~Adjusted Indoor Lighting Power ~~Density~~. (Indoor lighting not listed below shall comply with all applicable nonresidential indoor lighting requirements in Part 6.):

   A. In theme parks: Lighting for themes and special effects.

   B. Studio lighting for film or photography provided that these lighting systems are in addition to and separately switched from a general lighting system.

   C. Lighting for dance floors, lighting for theatrical and other live performances, and theatrical lighting used for religious worship, provided that these lighting systems are additions to a general lighting system and are separately controlled by a multiscene or theatrical cross-fade control station accessible only to authorized operators.

   Lighting intended for makeup, hair, and costume preparation in performing arts facility dressing rooms, provided that the lighting is separately switched from the general lighting system, switched independently at each dressing station, and is controlled with a Vacancy Sensor.

   D. In civic facilities, transportation facilities, convention centers, and hotel function areas: Lighting for temporary exhibits, if the lighting is in addition to a general lighting system and is separately controlled from a panel accessible only to authorized operators.

   E. Lighting installed by the manufacturer in walk-in coolers or freezers, vending machines, food preparation equipment, and scientific and industrial equipment.

   F. In office buildings with medical and clinical areas and healthcare facilities ~~medical and clinical buildings~~: Examination and surgical lights, low-ambient night-lights, and lighting integral to medical equipment, provided that these lighting systems are additions to and separately switched from a general lighting system.

   G. Lighting for plant growth or maintenance, if it is controlled by a multi-level astronomical time-switch control that complies with the applicable provisions of Section 110.9.

   H. Lighting equipment that is for sale.

   I. Lighting demonstration equipment in lighting education facilities.

   J. Lighting that is required for exit signs subject to the CBC. Exit signs shall meet the requirements of the Appliance Efficiency Regulations.

   K. Exit way or egress illumination that is normally off and that is subject to the CBC.

   L. In hotel/motel buildings: Lighting in guestrooms (lighting in hotel/motel guestrooms shall comply with Section 130.0(b). (Indoor lighting not in guestrooms shall comply with all applicable nonresidential lighting requirements in Part 6.)

   M. In high-rise residential buildings: Lighting in dwelling units (Lighting in high-rise residential dwelling units shall comply with Section 130.0(b).) (Indoor lighting not in dwelling units shall comply with all applicable nonresidential lighting requirements in Part 6.)

   N. Temporary lighting systems. (As defined in Section 100.1.)

   O. Lighting in occupancy group U buildings less than 1,000 square feet.

   P. Lighting in unconditioned agricultural buildings less than 2,500 square feet.

Q. Lighting systems in qualified historic buildings, as defined in the California Historical Building Code (Title 24, Part 8), are exempt from the Lighting Power Density allowances, if they consist solely of historic lighting components or replicas of historic lighting components. If lighting systems in qualified buildings contain some historic lighting components or replicas of historic components, combined with other lighting components, only those historic or historic replica components are exempt. All other lighting systems in qualified historic buildings shall comply with the Lighting Power Density allowances.

R. Lighting in nonresidential parking garages for seven or less vehicles: Lighting in nonresidential parking garages for seven or less vehicles shall comply with the applicable residential parking garage provisions of Section 150.0(k).

S. Lighting for signs: Lighting for signs shall comply with Section 140.8.

T. Lighting in refrigerated cases less than 3,000 square feet. (Lighting in refrigerated cases less than 3,000 square feet shall comply with the Title 20 Appliance Efficiency Regulations).

U. Lighting in elevators where the lighting meets the requirements in Section 120.6(f).

V. Lighting connected to a Life Safety Branch or Critical Branch, as specified in Section 517 of the California Electrical Code.

4. Luminaire Classification and Power Adjustment.

A. Luminaire Classification and Power shall be determined in accordance with Section 130.0(c).

B. Small Aperture Tunable-White and Dim-to-Warm Luminaires Lighting Power Adjustment. For qualifying small aperture tunable-white and dim-to-warm LED luminaires, the adjusted indoor lighting power of these luminaires shall be calculated by multiplying their maximum rated wattage by 0.75.
Qualifying luminaires shall meet all of the following:

i. Small Aperture. Qualifying luminaires longer than 18 inches shall be no wider than four inches.
Qualifying luminaires with a length of 18 inches or less shall be no wider than eight inches.

ii. Color Changing. Qualifying tunable-white luminaires shall be capable of a color change greater than or equal to 2000 Kelvin correlated color temperature (CCT). Qualifying dim-to-warm luminaires shall be capable of color change greater than or equal to 500 Kelvin CCT.

iii. Controls. Qualifying luminaires shall be connected to controls that allows color changing of the luminaires.

C. Tailored Method Display Lighting Mounting Height Lighting Power Adjustment. For wall display luminaires or floor display luminaires meeting Tailored Method Section 140.6(c)3G and H and where the bottom of luminaires are 10 feet 7 inches and greater above the finished floor, the adjusted indoor lighting power of these luminaires shall be calculated by multiplying their maximum rated wattage and the appropriated mounting height adjustment factor from TABLE 140.6-E. Luminaire mounting height is the distance from the finished floor to the bottom of the luminaire. General lighting shall not qualify for a mounting height multiplier.

(c) **Calculation of Allowed Indoor Lighting Power: Specific Methodologies.** The allowed indoor

Lighting Power for each building type, or each primary function area shall be calculated using only one of the methods in Subsection 1, 2 or 3 below as applicable.

1. **Complete Building Method.** Requirements for using the Complete Building Method include all of the following:

   A. The Complete Building Method shall be used only for building types, as defined in Section 100.1, that are specifically listed in TABLE 140.6-B. (For example, retail and wholesale stores, hotel/motel, and highrise residential buildings shall not use this method.)

   B. The Complete Building Method shall be used only on projects involving:

      i. Entire buildings with one type of use occupancy; or

         ~~**EXCEPTION to Section 140.6(c)1Bi:** If a parking garage plus another type of use listed in TABLE 140.6-B are part of a single building, the parking garage portion of the building and other type of use portion of the building shall each separately use the Complete Building Method.~~

      ii. Mixed occupancy buildings where one type of use makes up at least 90 percent of the entire building (in which case, when applying the Complete Building Method, it shall be assumed that the primary use is 100 percent of the building); or

      iii. A tenant space where one type of use makes up at least 90 percent of the entire tenant space (in which case, when applying the Complete Building Method, it shall be assumed that the primary use is 100 percent of the tenant space).

   C. The Complete Building Method shall be used only when the applicant is applying for a lighting permit and submits plans and specifications for the entire building or the entire tenant space.

   D. Under the Complete Building Method, the allowed indoor Lighting Power allotment is the Lighting Power Density value times the floor area of the entire building.

   E. <u>For buildings including a parking garage plus another type of use listed in TABLE 140.6-B, the parking garage portion of the building and other type of use portion of the building shall each separately use the Complete Building Method.</u>

2. **Area Category Method.** Requirements for using the Area Category Method include all of the following:

   A. The Area Category Method shall be used only for primary function areas, as defined in Section 100.1, that are listed in TABLE 140.6-C. <u>For primary function areas not listed, selection of a reasonably equivalent type shall be permitted.</u>

   B. Primary Function Areas in TABLE 140.6-C shall not apply to a complete building. Each primary function area shall be determined as a separate area.

   C. For purposes of compliance with Section 140.6(c)2, an "area" shall be defined as all contiguous areas that accommodate or are associated with a single primary function area listed in TABLE 146.0-C.

   D. Where areas are bounded or separated by interior partitions, the floor area occupied by those interior partitions may be included in a Primary Function Area.

   E. If at the time of permitting for a newly constructed building, a tenant is not identified for a multi-tenant area, a maximum of <u>0.4</u>~~0.6~~ watts per square foot shall be allowed for the

lighting in each area in which a tenant has not been identified. The area shall be classified as Unleased Tenant Area.

F. Under the Area Category Method, the allowed indoor Lighting Power for each primary function area is the Lighting Power Density value in TABLE 140.6-C times the square feet of the primary function area. The total allowed indoor Lighting Power for the building is the sum of all allowed indoor Lighting Power for all areas in the building.

G. In addition to the allowed indoor Lighting Power calculated according to Sections 140.6(c)2~~.~~A through F, the building may add additional lighting power allowances for qualifying lighting systems as specified in the Qualifying Lighting Systems column ~~specialized task work, ornamental, precision, accent, display, decorative, and white boards and chalk boards, in accordance with the footnotes~~ in TABLE 140.6-C under the following conditions:

iv. Only primary function areas having a lighting system as specified in the Qualifying Lighting Systems column ~~footnote next to the allowed Lighting Power Density allotments~~ in TABLE 140.6-C and in accordance with the corresponding footnote of the TABLE shall qualify for the ~~added~~ additional lighting power allowances ~~in accordance with the correlated footnote listed at the bottom of the table~~; and

v. The additional lighting power allowances shall be used only if the plans clearly identify all applicable task areas and the lighting equipment designed to illuminate these tasks; and

vi. Tasks that are performed less than two hours per day or poor quality tasks that can be improved are not eligible for the additional lighting power allowances; and

vii. The additional lighting power allowances shall not utilize any type of luminaires that are used for general lighting in the building; and

viii. The additional lighting power allowances shall not be used when using the Complete Building Method, or when the Tailored Method is used for any area in the building; and

ix. The additional lighting power allowed is the smaller of:

a. the lighting power density listed in the "Allowed Additional Lighting LPD" column ~~applicable footnote~~ in TABLE 140.6-C, times the square feet of the primary function, or

b. the ~~actual~~ Adjusted Indoor Lighting Power of ~~design wattage may be added to~~ the ~~allowed~~ applicable lighting ~~power~~; and

x. In addition to all other additional lighting power allowed under Sections 140.6(c)2Gi through vi, up to ~~1.5~~1.0 watts per square foot of additional lighting power shall be allowed in a videoconferencing studio, as defined in Section 100.1, provided the following conditions are met:

a. A completed and signed Installation Certificate is prepared and submitted in accordance with Section 130.4(b), specifically detailing compliance with the applicable requirements of Section 140.6(c)2Gvii; and

b. The Videoconferencing Studio is a room with permanently installed videoconferencing cameras, audio equipment, and playback equipment for both audio-based and video-based two-way communication between local and remote sites; and

c. General lighting is switched in accordance with TABLE 130.1-A; and

d. Wall wash lighting is separately switched from the general lighting system; and

e. All of the lighting in the studio, including general lighting and additional lighting power allowed by Section 140.6(c)2Gvii is controlled by a multiscene programmable control system (also known as a scene preset control system).

3. **Tailored Method.** Requirements for using the Tailored Method include all of the following:

A. The Tailored Method shall be used only for primary function areas listed in TABLE 140.6-D, as defined in Section 100.1~~, and for IES allowances listed in Section 140.6(c)3H~~.

B. Allowed Indoor Lighting Power allotments for general lighting shall be determined according to Section 140.6(c)3~~G or H~~F, as applicable. ~~General lighting shall not qualify for a mounting height multiplier.~~

C. For compliance with ~~this Item~~Section 140.6(c)3, an "area" shall be defined as all contiguous areas that accommodate or are associated with a single primary function area listed in TABLE 140.6-D.

D. Where areas are bounded or separated by interior partitions, the floor area occupied by those interior partitions may be included in a Primary Function Area.

E. In addition to the allowed indoor Lighting Power allotments for general lighting calculated according to Sections 140.6(c)3~~G or H~~F, as applicable, the building may add additional lighting power allowances for wall display lighting, floor display lighting and task lighting, ornamental/special effects lighting, and very valuable display~~s~~ cases lighting according to Section 140.6(c)~~3I~~ 3G through ~~LJ~~.

F. ~~The general lighting system shall not use narrow beam direction lamps, wall-washer, valance, direct cove, or perimeter linear slot types of lighting systems.~~

~~G~~F. Determine allowed indoor Lighting Power allotments for general lighting for primary function areas listed in TABLE 140.6-D as follows:

xi. Use the General ~~IES Illuminance~~Illumination ~~values~~ Level (Lux) listed in Column 2 of Table 140.6-D to determine the Allowed General Lighting Power Density allotments for the area.

xii. Determine the room cavity ratio (RCR) for the area. The RCR shall be calculated according to the applicable equation in TABLE 140.6-F.

xiii. Find the allowed General Lighting Power Density allotments in TABLE 140.6-G that is applicable to the ~~IES~~ General Iilluminance ~~value~~ Level (Lux) from Column 2 of Table 140.6-D (as described in Item i.) and the RCR determined in accordance with TABLE 140.6-F (as described in Item ii).

xiv. Determine the square feet of the area in accordance with Section 140.6(c)3C and D.

xv. Multiply the allowed Lighting Power Density allotment, as determined in accordance with Item iii by the square feet of each primary function area, as determined in accordance with Item iv. The product is the Allowed Indoor Lighting Power allotment for general lighting for the area.

~~H. Determine allowed indoor Lighting Power allotments for general lighting for only specific primary function areas NOT listed in TABLE 140.6-D as follows:~~

~~i. Use this Section only to calculate allowed indoor lighting power for general lighting in the following primary function areas. Do not use Section 140.6(c)3H for~~

~~any primary function areas NOT listed below:~~

~~a. Exercise Center,~~

~~Gymnasium b. Medical~~

~~and Clinical Care~~

~~c. Police Stations and Fire Stations~~

~~d. Public rest areas along state and federal roadways~~

~~e. Other primary function areas that are listed in neither TABLE 140.6-C nor~~

~~TABLE140.6-D. ii. When calculating allowed indoor Lighting Power allotments for general lighting using Section~~

~~140.6(c)3H, the building shall not add additional lighting power allowances for any other use, including but not limited to wall display, floor display and task, ornamental/special effects, and very valuable display case lighting.~~

~~iii. Calculate the allowed indoor Lighting Power for each primary function area in the building as follows:~~

~~a. Determine the illuminance values (Lux) according to the Tenth Edition IES Lighting Handbook (IES HB), using the Recommended Horizontal Maintained Illuminance Targets for Observers 25-65 years old for illuminance.~~

~~b. Determine the room cavity ratio (RCR) for area. The RCR shall be calculated according to the applicable equation in TABLE 140.6-F.~~

~~c. Find the allowed lighting power density in TABLE 140.6-G that is applicable to the illuminance value (Lux) determined in accordance with Item (a) and the RCR determined in accordance with Item (b).~~

~~d. Determine the square feet of the area. For compliance with this item, an "area" shall be defined as all contiguous areas that accommodate or are associated with a single primary function area listed in Item (i). Where areas are bounded or separated by interior partitions, the floor area occupied by those interior partitions may be included in a Primary Function Area.~~

~~e. Multiply the square feet determined in accordance with Item (d), by the allowed lighting power density determined in accordance with item (c). The product is the Allowed Indoor Lighting Power allotment for general lighting for the area.~~

I~~G~~. Determine additional allowed power for wall display lighting according to column 3 of Table 140.6-D for each primary function area as follows:

~~i. Additional wall display lighting power shall not be available when using Section 140.6(c)3H for determining the Allowed Indoor Lighting Power allotment for general lighting for the area.~~

~~ii~~i. Floor displays shall not qualify for wall display allowances.

~~v.~~ Qualifying wall lighting shall:

a. Be mounted within 10 feet of the wall having the wall display. When track lighting is used for wall display, and where portions of that lighting track are more than 10 feet from the wall and other portions are within 10 feet of the wall, portions of track more than 10 feet from the wall shall not be used for the wall display

allowance.

b. Be a lighting system type appropriate for wall lighting. Lighting systems appropriate for wall lighting are lighting track adjacent to the wall, wall-washer luminaires, luminaires behind a wall valance or wall cove, or accent light. (Accent luminaires are adjustable or fixed luminaires with PAR, R, MR, AR, or ~~other directional lamp types~~luminaires providing directional display light.)

~~iv~~iii. Additional allowed power for wall display lighting is available only for lighting that illuminates walls having wall displays. The length of display walls shall include the length of the perimeter walls, including but not limited to closable openings and permanent full height interior partitions. Permanent full height interior partitions are those that (I) extend from the floor to ~~no more than~~within two feet of the ceiling or ~~(II)~~ are taller than ten feet, and ~~(II)~~ (II)are permanently anchored to the floor~~, provided, however, that neither commercial industrial stacks nor industrial storage stacks are permanent full height interior partitions~~.

~~v~~iv. ~~The wall display mounting height multiplier is the applicable factor from TABLE 140.6-E. Mounting height is the distance from the finished floor to the bottom of the luminaire. The wall display mounting height multipliers shall be used to reduce the design watts of the space.~~ For wall display lighting where the bottom of the luminaire is greater than 10 feet 6 inches above the finished floor, the mounting height adjustment factor from Table 140.6-E can be used to adjust the installed luminaire wattage as specified in Section 140.6(a)4C.

~~ix.~~ The ~~additional~~ allowed power for wall display lighting shall be the smaller of:

a. ~~The~~ the "~~product of~~ wall display lighting power density" determined in accordance with TABLE 140.6-D, ~~times~~ multiplied by the wall display lengths determined in accordance with Item ~~iv~~iii; ~~. or~~ and
b. The ~~actual~~ Adjusted Indoor Lighting P~~p~~ower used for the wall display lighting systems.

vi. Lighting internal to display cases that are attached to a wall or directly adjacent to a wall are counted as wall display lighting as specified in Section 140.6(c)3G. All other lighting internal to display cases are counted as floor display lighting as specified in Section 140.6(c)3H, or as very valuable display case lighting as specified in Section 140.6(c)3J.

~~J~~H. Determine additional allowed power for floor display lighting and task lighting as follows:

~~i. Neither additional allowed power for floor display lighting nor additional allowed power for task lighting shall be available when using Section 140.6(c)3H for determining allowed indoor Lighting Power allotment for general lighting.~~

~~ii~~i. Displays that are installed against a wall shall not qualify for the floor display lighting power allowances.

~~iii~~ii. Lighting internal to display cases that are not attached to a wall and not directly adjacent to a wall, shall be counted as floor display lighting in accordance with Section 140.6(c)~~3J~~3H; or very valuable display case lighting in accordance with Section 140.6(c)3~~Liii and iv~~J.

~~iv~~iii. Additional allowed power for floor display lighting, and additional allowed power for task lighting, may be used by qualifying floor display lighting systems, qualifying task lighting systems, or a combination of both. For floor areas qualifying

for both floor display and task lighting power allowances, the additional allowed power shall be used only once for the same floor area, so that the allowance shall not be additive.

~~ix.~~ Qualifying floor display lighting shall:

a. Be mounted no closer than 2 feet to a wall.

b. Consist of only (I) directional ~~lighting~~ lamp types, such as PAR, R, MR, AR; or (II) ~~lighting employing optics~~luminaires providing directional display light ~~from nondirectional lamps~~.

c. If track lighting is used, shall be only track heads that are classified as direction lighting types.

~~ix.~~ Qualifying task lighting shall:

a. Be located immediately adjacent to and capable of illuminating the task for which it is installed.

b. Be of a type different from the general lighting system.

c. Be separately switched from the general lighting system.

~~vii~~vi. If there are illuminated floor displays, floor display lighting power shall be used only if allowed by column 4 of TABLE 140.6-D.

vii~~i. Additional allowed power for a combination of floor display lighting and task lighting shall be available only for (I) floors having floor displays; or (II) floors not having floor displays but having tasks having illuminance recommendations that appear in the Tenth Edition of the IES Lighting Handbook and that are higher than the general lighting level in column 2 of TABLE 140.6-D.~~ The square footage of floor displays or the square footage of task areas shall be determined in accordance with Section 140.6(c)3C and D, except that any floor area designed to not have floor displays or tasks, such as floor areas designated as a path of egress, shall not be included for the floor display allowance.

~~ix~~viii. For floor display lighting where the bottom of the luminaire is greater than 10.6 feet above the finished floor, multiply the floor display installed watts by the appropriate mounting height adjustment factor from Table 140.6-E ~~can be used~~ to calculate the ~~adjust the installed luminaire wattage~~Adjusted Indoor Lighting Power as specified in Section 140.6(a)4C. ~~For floor display lighting where the bottom of the luminaire is 12 feet or higher above the finished floor, the wattage allowed in column 4 of TABLE 140.6-D may be increased by multiplying the floor display lighting power allowance by the appropriate factor from TABLE 140.6-E Luminaire mounting height is the distance from the finished floor to the bottom of the luminaire.The floor display mounting height multipliers shall be used to reduce the design watts of the space.~~

ix. The ~~additional~~ allowed power for floor display lighting for each applicable area shall be the smaller of:

a. ~~The~~ the ~~product of~~ allowed floor display and task lighting power determined in accordance with Section 140.6(c)~~3Jvii~~ 3Hvi ~~times~~ multiplied by the floor square footage determined in accordance with Section 140.6(c)~~3J~~3Hvii~~viii;~~. and ~~or~~

b. The ~~actual power~~Adjusted Indoor Lighting Power used for the floor display

lighting systems.

~~K~~I. Determine additional allowed power for ornamental/special effects lighting as follows:

~~i. Additional allowed power for ornamental/special effects lighting shall not be available when using Section 140.6(c)3H for determining general Lighting Power allowances.~~

~~ii.~~ Qualifying ornamental lighting includes luminaires such as chandeliers, sconces, lanterns, neon and cold cathode, light emitting diodes, theatrical projectors, moving lights and light color panels when any of those lights are used in a decorative manner that does not serve as display lighting or general lighting.

~~iii~~ii. Additional lighting power for ornamental/special effects lighting shall be used only if allowed by Column 5 of TABLE 140.6-D.

~~iv~~iii. Additional lighting power for ornamental/special effects lighting shall be used only in areas having ornamental/special effects lighting. The square footage of the floor area shall be determined in accordance with Section 140.6(c)3C and D, and it shall not include floor areas not having ornamental/special effects lighting.

~~ix.~~ The additional ~~additional~~ allowed power for ornamental/special effects lighting for each applicable area shall be the smaller of:

a. ~~The~~ the product of the "allowed ornamental/special effects lighting power" determined in accordance with Section 140.6(c)~~3Kiii~~3Kii, ~~times~~ multiplied by the floor square footage determined in accordance with Section 140.6(c)~~3Kiv~~3Kiii; ~~or~~and

b. ~~The actual power~~The Adjusted Indoor Lighting Power of allowed ornamental/special effects lighting.

~~L~~J. Determine additional allowed power for very valuable display case lighting as follows:

~~i. Additional allowed power for very valuable display case lighting shall not be available when using Section 140.6(c)3H for determining general Lighting Power allowances.~~

~~ii.~~ Additional allowed power for very valuable display case lighting shall be available only for display cases in appropriate function areas in retail merchandise sales, museum and religious worship.

~~iii~~ii. To qualify for additional allowed power for very valuable display case lighting, a case shall contain jewelry, coins, fine china, fine crystal, precious stones, silver, small art objects and artifacts, and/or valuable collections the display of which involves customer inspection of very fine detail from outside of a locked case.

~~iv~~iii. Qualifying lighting includes internal display case lighting or external lighting employing highly directional luminaires specifically designed to illuminate the case or inspection area without spill light, and shall not be fluorescent lighting unless installed inside of a display case.

~~ix.~~ If there is qualifying very valuable display case lighting, in accordance with Section 140.6(c)~~3Liii~~3Jii, the smallest of the following separate lighting power for display cases presenting very valuable display items is permitted:

a. The product of the area of the primary function and ~~0.8~~0.55 watt per square foot; or

b. The product of the area of the display case and ~~12~~ 8 watts per square foot; or

c. The ~~actual~~ Adjusted Indoor Lighting ~~power~~ Power of lighting for very valuable displays.

d. Be controlled in accordance with the applicable requirements in Section 130.1(d)~~2~~2; and

e. All Secondary Sidelit Daylit Zones shall be shown on the plans submitted to the enforcing agency.

EXCEPTION 1 to Section 140.6(d): Luminaires in Secondary Sidelit Daylit Zone(s) in ~~areas~~ an enclosed space in which the combined total general lighting power in Secondary Daylit Zone(s) ~~where the total wattage of general lighting~~ is less than 120 ~~Watts~~watts, or where the combined total general lighting power in Primary and Secondary Daylit Zone(s) is less than 240 watts.

EXCEPTION 2 to Section 140.6(d): Luminaires in parking garages complying with Section 130.1(d)3.

EXCEPTION 3 to Section 140.6(d): Areas adjacent to vertical glazing below an overhang, where there is no vertical glazing above the overhang and where the ratio of the overhang projection to the overhang rise is greater than 1.5 for South, East and West orientations, or where the ratio of the overhang projection to the overhang rise is greater than 1 for North orientations.

EXCEPTION 4 to Section 140.6(d): Rooms that have a total glazing area of less than 24 square feet, or parking garage areas with a combined total of less than 36 square feet of glazing or opening.

EXCEPTION 5 to Section 140.6(d): Luminaires in sidelit daylit zones in retail merchandise sales and wholesale showroom areas.

Updated Table 140.6-B

TABLE 140.6-B COMPLETE BUILDING METHOD LIGHTING POWER DENSITY VALUES

TYPE OF BUILDING	ALLOWED LIGHTING POWER DENSITY (WATTS PER SQUARE FOOT)
~~Auditorium~~ Assembly Building	~~1.40~~0.70
~~Classroom Building~~	~~1.1~~
~~Commercial and Industrial Storage~~Commercial and ~~Industrial Storage~~ Building	~~0.600~~.45
~~Convention Center Building~~	~~1.0~~
Financial Institution Building	~~1.00~~0.65
~~General Commercial Building/Industrial Work~~Industrial/Manufacturing ~~Building~~Facility Building	~~1.000~~.60
Grocery Store Building	~~1.50~~0.95
Gymnasium Building	0.65
Library Building	~~1.20~~.70
Healthcare Facility	0.90
~~Medical Building/Clinic Building~~	~~1.0~~
Office Building	~~0.800~~.65
Parking Garage Building	~~0.200~~.13
Religious Facility ~~Facility~~ Building	~~1.50~~.70
Restaurant Building	~~1.10~~.70
Retail Store Building	0.90
School Building	~~0.950~~.65
Sports Arena Building	0.75

~~Theater Building~~	~~1.3~~
Motion Picture Theater Building	0.70
Performing Arts Theater Building	0.80
All others buildings	~~0.50~~0.40

Updated Table 140.6-C

TABLE 140.6-C AREA CATEGORY METHOD - LIGHTING POWER DENSITY VALUES (WATTS/FT²)

Primary Function Area		**Allowed Lighting Power Density for General Lighting (W/ft²)**	**Additional Lighting Power[1]**	
			Qualified Lighting Systems	**Additional Allowance (W/ft², unless noted otherwise)**
Auditorium Area		0.70	Ornamental	0.30
			Accent, display and feature[3]	0.20
Auto Repair / Maintenance Area		0.55	Detailed Task Work[7]	0.20
Audience Seating Area		0.60	Ornamental	0.30
Beauty Salon Area		0.80	Detailed Task Work[7]	0.20
			Ornamental	0.30
Civic Meeting Place Area		1.00	Ornamental	0.30
Classroom, Lecture, Training, Vocational Areas		0.70	White or Chalk Board[1]	4.50 W/ft
Commercial/Industrial Storage	Warehouse	0.45	-	-
	Shipping & Handling	0.60	-	-
Convention, Conference, Multipurpose and Meeting Area		0.85	Ornamental	0.30
Copy Room		0.50	-	-
Corridor Area		0.60	-	-
Dining Area	Bar/Lounge and Fine Dining	0.55	Ornamental	0.30
	Cafeteria/Fast Food	0.40		
	Family and Leisure	0.50		
Electrical, Mechanical, Telephone Rooms		0.40	Detailed Task Work[7]	0.20
Exercise/Fitness Center and Gymnasium Areas		0.50	-	-
Hotel Function Area		0.85	Ornamental	0.30
Museum Area	Exhibition/Display	0.60	Accent, display and feature[3]-	-0.50
	Restoration Room	0.75	Detailed Task Work[7]	0.20
Financial Transaction Area		0.80	Ornamental	0.30
General/Commercial & Industrial Work Areas	Low Bay	0.60	Detailed Task Work[7]	0.20
	High Bay	0.65	Detailed Task Work[7]	0.20
	Precision	0.85	Precision Specialized Work[9]	0.70
Library	Reading Area	0.80	Ornamental	0.30
	Stacks Area	1.10	-	-
Main Entry Lobby		0.85	Ornamental	0.30
Locker Room		0.45	-	-
Lounge, Breakroom, or Waiting Areas		0.65	Ornamental	0.30
Concourse and Atria Area		0.90	Ornamental	0.30

Office Area	> 250 square feet	0.65	Portable lighting for office areas[6]	0.20
	≤ 250 square feet	0.70		
	Open plan office	0.60		
Parking Garage Area	Parking Zone	0.10	First ATM	100 W
			Additional ATM	50 W each
	Dedicated Ramps	0.25	-	-
	Daylight Adaptation Zones[2]	0.50	-	-
Pharmacy Area		1.10	Specialized Task Work[8]	0.35
Retail Sales Area	Grocery Sales	1.05	Accent, display and feature[3]	0.20
			Decorative	0.15
	Retail Merchandise Sales	1.00	Accent, display and feature[3]	0.20
			Decorative	0.15
	Fitting Room	0.60	External Illuminated Mirror[5]	40 W/ea
			Internal Illuminated Mirror[5]	120 W/ea
Theater Area	Motion picture	0.60	Ornamental	0.30
	Performance	1.00		
Kitchen/Food Preparation Area		0.95	-	-
Scientific Laboratory Area		1.00	Specialized Task Work[8]	0.35
Healthcare Facility and Hospitals	Exam/Treatment Room	1.15	-	-
	Imaging Room	1.00	-	-
	Medical Supply Room	0.55	-	-
	Nursery	0.95	Tunable white or dim-to-warm[10]	0.10
	Nurse's Station	0.75	Tunable white or dim-to-warm[10]	0.10
	Operating Room	1.90	-	-
	Patient Room	0.55	Decorative	0.15
			Tunable white or dim-to-warm[10]	0.10
	Physical Therapy Room	0.85	Tunable white or dim-to-warm[10]	0.10
	Recovery Room	0.90	Tunable white or dim-to-warm[10]	0.10
--Laundry Area		0.45	-	-
Religious Worship Area		0.95	Ornamental	0.30
Restrooms		0.65	Accent, display and feature[3]-	0.20-
			Decorative[4]	0.15
Transportation Function	Baggage Area	0.40	-	-
	Ticketing Area	0.45	Accent, display and feature[3]	0.20
Sports Arena – Playing Area	Class I Facility[13]	2.25	-	-
	Class II Facility[13]	1.45	-	-
	Class III Facility[13]	1.10	-	-
	Class IV Facility[13]	0.75	-	-

Stairwell		0.50	Accent, display and feature[3]	0.20
			Decorative[4]	0.15
Videoconferencing Studio ~~0.90~~		0.90	Videoconferencing	1.00
All other ~~0.40~~		0.40	-	-
Aging Eye/Low-vision[11]	Main Entry Lobby	0.85	Ornamental	0.30
			Transition Lighting OFF at night[12]	~~0~~95
	Stairwell	0.80	-	-
	Corridor Area	0.80	Decorative[4]	0.15
	Lounge/Waiting Area	0.75	Ornamental	0.30
	Multipurpose Room	0.95	Ornamental	0.30
	Religious Worship Area	1.00	Ornamental	0.30
	Dining	0.80	Ornamental	0.30
	Restroom	0.80	Accent, display and feature[3]	0.20

~~PRIMARY FUNCTION AREA~~	~~ALLOWED LIGHTING POWER DENSITY (W/ft²)~~		~~PRIMARY FUNCTION AREA~~		~~ALLOWED LIGHTING POWER DENSITY (W/ft²)~~
~~Auditorium Area~~	~~1.40~~ [3]		~~Library Area~~	~~Reading areas~~	~~1.1~~ [3]
~~Auto Repair Area~~	~~0.90~~ [2]			~~Stack areas~~	~~1.5~~ [3]
~~Beauty Salon Area~~	~~1.7~~		~~Lobby Area~~	~~Hotel lobby~~	0.95 [3]
~~Civic Meeting Place Area~~	1.3 [3]			~~Main entry lobby~~	0.95 [3]
~~Classroom, Lecture, Training, Vocational Areas~~	1.2 [5]		~~Locker/Dressing Room~~		~~0.70~~
~~Commercial and Industrial Storage Areas (conditioned and unconditioned)~~	~~0.60~~		~~Lounge Area~~		0.90 [3]
~~Commercial and Industrial Storage Areas (refrigerated)~~	~~0.7~~		~~Malls and Atria~~		0.95 [3]
~~Convention, Conference, Multipurpose and Meeting Center Areas~~	~~1.2~~ [3]		~~Medical and Clinical Care Area~~		~~1.2~~
~~Corridor, Restroom, Stair, and Support Areas~~	~~0.60~~		~~Office Area~~	~~> 250 square feet~~	~~0.75~~
~~Dining Area~~	~~1.0~~ [3]			~~≤ 250 square feet~~	~~1.0~~
~~Electrical, Mechanical, Telephone Rooms~~	0.55 [2]		~~Parking Garage Area~~	~~Parking Area~~ [10]	~~0.14~~
~~Exercise Center, Gymnasium Areas~~	~~1.0~~			~~Dedicated Ramps~~	~~0.30~~
~~Exhibit, Museum Areas~~	~~1.8~~			~~Daylight Adaptation Zones~~ [9]	~~0.60~~
~~Financial Transaction Area~~	~~1.0~~ [3]		~~Religious Worship Area~~		~~1.5~~ [3]
~~General Commercial and Industrial Work Areas~~ ~~Low bay~~	~~0.9~~ [2]		~~Retail Merchandise Sales, Wholesale Showroom Areas~~		~~1.2~~ [6 and 7]
~~High bay~~	~~1.0~~ [2]				
~~Precision~~	~~1.2~~ [4]		~~Theater Area~~	~~Motion picture~~	0.90 [3]
~~Grocery Sales Area~~	~~1.2~~ [6 and 7]			~~Performance~~	~~1.4~~ [3]
~~Hotel Function Area~~	~~1.4~~[3]		~~Transportation Function Area~~	~~Concourse & Baggage~~	~~0.50~~
				~~Ticketing~~	~~1.0~~

~~Kitchen, Food Preparation Areas~~	~~1.2~~		~~Videoconferencing Studio~~	~~1.2~~[8]
~~Laboratory Area, Scientific~~	~~1.4~~[1]		~~Waiting Area~~	0.80[3]
~~Laundry Area~~	~~0.70~~		~~All other areas~~	~~0.50~~

Footnotes for this table are listed below.

61. White board or chalk board. – Directional lighting dedicated to a white board or chalk board.

92. Daylight Adaptation Zones shall be no longer than 66 feet from the entrance to the parking garage.

~~10~~3. Accent, display and feature lighting – luminaires shall be adjustable or directional.

~~11~~4. Decorative lighting – primary function shall be decorative and not to provide general lighting.

~~12~~5. Illuminated mirrors. Lighting shall be dedicated to the mirror.

~~13~~6. Portable lighting in office areas includes under shelf or furniture-mounted supplemental task lighting qualifies when controlled by a time clock or an occupancy sensor.

7. Detailed task work – Lighting provides high level of visual acuity required for activities with close attention to small elements and/or extreme close up work.

8. Specialized task work – Lighting provides for small-scale, cognitive or fast performance visual tasks; lighting required for operating specialized equipment associated with pharmaceutical/laboratorial activities.

9. Precision specialized work – Lighting for work performed within a commercial or industrial environment that entails working with low contrast, finely detailed, or fast moving objects.

10. Tunable white luminaires capable of color change greater than or equal to 2000K CCT, or dim-to-warm luminaires capable of color change greater than or equal to 500K CCT, connected to controls that allows color changing of the luminaires.

11. Aging Eye/Low-vision areas can be documented as being designed to comply with the light levels in ANSI/IES RP-28 and are or will be licensed by local or state authorities for either senior long-term care, adult day care, senior support, and/or people with special visual needs.

12. Transition lighting OFF at night. Lighting power controlled by astronomical time clock or other control to shut off lighting at night. Additional LPD only applies to area within 30 feet of an exit. Not applicable to lighting in daylit zones.

13. Class I Facility is used for competition play for 5000 or more spectators. Class II Facility is used for competition play for up to 5000 spectators. Class III Facility is used for competition play for up to 2000 spectators. Class IV Facility is normally used for recreational play and there is limited or no provision for spectators.

~~FOOTNOTES FOR TABLE 140.6-C:~~

~~See Section 140.6(c)2 for an explanation of additional lighting power available for specialized task work, ornamental, precision, accent, display, decorative, and white boards and chalk boards, in accordance with the footnotes in this table. The smallest of the added lighting power listed in each footnote below, or the actual design wattage, may be added to the allowed lighting power only when using the Area Category Method of compliance~~.

~~Footnote number~~	~~Type of lighting system allowed~~	Allowed lighting power density. (W/ft^2 of task area ~~unless otherwise noted)~~
1	~~Specialized task work~~	~~0.20 W/ft^2~~
2	~~Specialized task work~~	~~0.50 W/ft^2~~
3	~~Ornamental lighting as defined in Section 100.1 and in accordance with Section 140.6.(c)2~~.	~~0.50 W/ft^2~~
4	~~Precision commercial and industrial work~~	~~1.0 W/ft^2~~
5	~~Per linear foot of white board or chalk board~~.	~~5.5 W per linear foot~~
6	~~Accent, display and feature lighting - luminaires shall be adjustable or directional~~	~~0.30 W/ft^2~~
7	~~Decorative lighting - primary function shall be decorative and shall be in addition to general illumination~~.	~~0.20 W/ft^2~~
8	~~Additional Videoconferencing Studio lighting complying with all of the requirements in Section 140.6(c)2Gvii.~~	~~1.5 W/ft^2~~
9	~~Daylight Adaptation Zones shall be no longer than 66 feet from the entrance to the parking garage~~	
~~10~~	~~Additional allowance for ATM locations in Parking Garages. Allowance per ATM.~~	~~200 watts for first ATM location. 50 watt for each additional ATM location in a group~~.

Updated Table 140.6-D

TABLE 140.6-D TAILORED METHOD LIGHTING POWER ALLOWANCES

1	2	3	4	5

Primary Function Area	General Illumination Level (Lux)	Wall Display Lighting Power Density (W/ft)	Allowed Combined Floor Display Power and Task Lighting Power Density (W/ft²)	Allowed Ornamental/ Special Effect Lighting Power Density (W/ft²)
Auditorium Area	300	~~2.25~~3.00	~~0.3~~0.20	~~0.5~~0.40
~~Civic Meeting Place~~	~~300~~	~~3.15~~	~~0.2~~	~~0.5~~
Convention, Conference, Multipurpose, and Meeting Center Areas	300	~~2.50~~2.00	~~0.4~~0.35	~~0.5~~0.40
Dining Areas	200	~~1.50~~1.25	~~0.6~~0.50	~~0.5~~0.40
Exhibit, Museum Areas	150	~~15.0~~11.50	~~1.2~~0.80	~~0.5~~0.40
~~Financial Transaction Area~~	~~300~~	~~3.15~~	~~0.2~~	~~0.5~~
~~Grocery Store Area~~	~~500~~	~~8.00~~	~~0.9~~	~~0.5~~
Hotel Area:				
~~Hotel Function Area~~Ballroom/Events	400	~~2.25~~1.80	~~0.2~~0.12	~~0.5~~0.40
~~Lobby Area:~~				
~~Hotel l~~Lobby	200	~~3.15~~3.50	0.20	~~0.5~~0.40
Main entry lobby	200	03.50	0.20	00.40
~~Lounge Area~~	~~200~~	~~7.00~~	0	~~0.5~~
~~Malls and Atria~~	~~300~~	~~3.50~~	~~0.5~~	~~0.5~~
Religious Worship Area	300	~~1.50~~1.30	~~0.5~~0.40	~~0.5~~0.40
Retail Sales				
Grocery	600	6.80	0.70	0.40
~~Retail~~ Merchandise Sales, and Showroom Areas	~~400~~500	~~14.00~~11.80	~~1.0~~0.80	~~0.5~~0.40
Theater Area:				
Motion picture	200	~~3.00~~2.00	00.20	~~0.5~~0.40
Performance Arts	200	~~6.00~~7.50	00.20	~~0.5~~0.40
~~Transportation Function Area~~	~~300~~	~~3.15~~	~~0.3~~	~~0.5~~
~~Waiting Area~~	~~300~~	~~3.15~~	~~0.2~~	~~0.5~~

Updated Table 140.6-E

TABLE 140.6-E TAILORED ~~ADJUSTMENTS FOR~~WALL AND FLOOR DISPLAY MOUNTING HEIGHT ~~ABOVE FLOOR~~ADJUSTMENT FACTORSFACTORS

Height in feet above finished floor and bottom of luminaire(s)	Floor Display or Wall Display – ~~Multiply by~~Mounting Height Adjustment Factor
< ~~12~~'10'-7"	1.00
~~12'~~ 10'-7" to ~~16~~'14'-0"	~~0.87~~0.85
>14'-0" to 18'-0"	0.75
> ~~16~~'18'-0"	~~0.77~~0.70

Updated Table 140.6-G

TABLE 140.6-G TAILORED METHOD GENERAL LIGHTING POWER ALLOWED – ~~ILLUMINANCE LEVEL (LUX) POWER DENSITY VALUES (WATTS/FT²)~~BY ILLUMANCE AND ROOM CAVITY RATIO

	General Lighting Power Density (W/ft²) for the following RCR values[b] ~~values[b]~~ –

General Illuminance Level (lLux)[a]	RCR ≤ 2.0	RCR > 2.0 and ≤ 3.5	RCR > 3.5 and ≤ 7.0	RCR > 7.0
50	0.18	0.22	0.32	0.46
100	0.30	0.38	0.56	0.84
150	0.50.40	0.70.45	1.050.60	1.5500.75
200	0.480.45	0.640.55	0.880.75	1.341.00
300	0.640.65	0.820.80	1.121.00	1.761.40
400	0.780.75	0.980.95	1.341.25	2.081.50
500	0.90	1.101.05	1.521.45	2.321.85
600	1.08	1.24	1.64	2.38
[a] Illuminance values from Column 2 of TABLE 140.6-D. [b] RCR values are calculated using applicable equations in TABLE 140.6-F.				
600	1.06	1.26	1.74	2.60
700	1.24	1.46	1.82	2.96
800	1.44	1.70	2.28	3.30
900	1.66	2.00	2.64	3.74
1000	1.84	2.20	2.90	4.06

5.2 Reference Appendices

5.2.1 NA7.7.3

NA7.7.3 RESERVED ~~Track Lighting Integral Current Limiter~~

~~NA7.7.3.1 Certification requirements~~

~~(a) Verify that the track lighting integral current limiter is certified to the Energy Commission in accordance with Section 110.9 by checking the Energy Commission database. If the track current limiter has not been certified to the Energy Commission, this method for determining installed lighting power shall not be used for compliance with Title 24, Part 6, and the installation test shall be terminated.~~

~~NA7.7.3.2 Installation Inspection~~

~~Verify and document the following on the approved installation compliance form:~~

~~(a) The track current limiter is used exclusively on the same manufacturer's track for which it is designed.~~

~~(b) The track current limiter is designed and installed so that the track current limiter housing is permanently attached to the track so that the system will be irreparably damaged if the integral track current limiter housing were to be removed after installation into the track. Methods of attachment may include but are not limited to one-way barbs, rivets, and one-way screws.~~

~~(c) The track current limiter has identical volt-ampere (VA) rating of the track current limiter, as installed and rated for compliance with Title 24, Part 6, clearly marked as follows:~~

~~1. So that it is visible for the building officials' field inspection without opening cover plates, fixtures, or panels.~~

~~2. Permanently marked on the circuit breaker.~~

~~3. On a factory-printed label that is permanently affixed to a non-removable base plate inside the wiring compartment.~~

~~(d) The track current limiter employs tamper resistant fasteners for the cover to the wiring compartment.~~

~~(e) The track current limiter has a conspicuous factory installed label permanently affixed to the inside of the wiring compartment warning against removing, tampering with, rewiring, or bypassing the device.~~

~~(f) Each electrical panel from which track lighting integral current limiters are connected has a factory printed label permanently affixed and prominently located, with the following information: "NOTICE: Current limiting devices installed in track lighting integral current limiters connected to this panel shall only be replaced with the same or lower amperage. Adding track or replacement of existing current limiters with higher continuous ampere rating will void the track lighting integral current limiter certification, and will require re-submittal and re-certification of California Title 24, Part 6 compliance documentation."~~

~~(g) For installations where a total of five or less track current limiters are installed in a single building, all integral track current limiters shall be inspected. For installations where a total of more than five track current limiters are installed in a single building, no less than five track current limiters shall be inspected, up to five inspections for each 20 installed track current limiters.~~

~~(h) If any of the above requirements fail, the track current limiter fails the installation test, and this method for determining installed lighting power shall not be used for compliance with Title 24.~~

5.2.2 NA7.7.4

NA7.7.4 RESERVED ~~Line-Voltage Track Lighting Supplementary Overcurrent Protection Panel~~

~~NA7.7.4.1 Installation Inspection~~

~~Verify and document the following on the approved compliance form:~~

~~(a) The supplementary overcurrent protection panel is Listed, as defined in Section 100.1.~~

~~(b) The supplementary overcurrent protection panel is used only for line voltage track lighting. No other lighting or building power is connected to a track lighting supplementary overcurrent protection panel.~~

~~(c) No overcurrent protection panel has been used to determine installed wattage for any lighting system other than line-voltage track lighting.~~

~~(d) The supplementary overcurrent protection panel is installed in an electrical equipment room, or permanently installed adjacent to the lighting panel board providing supplementary overcurrent protection for the track lighting circuits served by the supplementary over current protection pane.~~

~~(e) There is a prominently labeled permanently attached to the panel by the manufacturer with the following information: "NOTICE: This Panel for Track Lighting Energy Code Compliance Only. The overcurrent protection devices in this panel shall only be replaced with the same or lower amperage. No other overcurrent protective device shall be added to this panel. Adding to, or replacement of existing overcurrent protective device(s) with higher continuous ampere rating, will void the panel listing and require re-submittal and re-certification of California Title 24, Part 6 compliance documentation."~~

~~(f) If any of the above requirements fail, the supplementary overcurrent protection panel fails the Installation test, and this method for determining installed lighting power shall not be used for compliance with Title 24.~~

ATTACHMENT 1: FINAL CASE REPORT

The final version of the CASE Report is provided in full in Attachment 1 to this report.

ATTACHMENT 2: PUBLIC COMMENTS SUBMITTED BY THE STATEWIDE CASE TEAM

The Statewide CASE Team did not submit any comments to the Energy Commission's docket that were relevant to this measure.