
7 Sign Lighting

7.1 Overview

The Sign Lighting Standards conserve energy, reduce peak electric demand, and are technically feasible and cost effective. They set minimum control requirements, maximum allowable power levels and minimum efficacy requirements.

7.1.1 History and Background

Regulations for lighting have been in effect in California since 1977, but until the adoption of the 2005 Standards only addressed indoor lighting, inside spaces that were air conditioned or heated, and outdoor lighting that was connected to a lighting panel when the lighting panel was located inside a conditioned building. The 2005 Standards expanded the scope to include most outdoor lighting applications, indoor and outdoor sign lighting applications, and indoor lighting applications in unconditioned buildings.

The 2008 Sign Lighting Standards evolved over a three year period through a dynamic, open, public process. The Energy Commission solicited ideas, proposals, and comments from a number of interested parties, and encouraged all interested persons to participate in a series of public hearings and workshops through which the Energy Commission gathered information and viewed presentations on energy efficiency possibilities from a variety of perspectives. The Energy Commission hired a consulting team that included a number of nationally recognized lighting experts to assist in the development of the Standards.

7.1.2 Scope and Application

The 2008 Sign Lighting Standards address both indoor and outdoor signs. The Standards include control requirements for all illuminated signs (§133), as well as set limits on installed lighting power for internally illuminated and externally illuminated signs (§148).

7.1.3 No Trade-offs

The Standards do not allow trade-offs between sign lighting power allowances and other end uses, such as outdoor lighting, indoor lighting, HVAC, building envelope, or water heating.

7.1.4 Summary of Requirements

§119, §130, §133, §148 and §149

A. Mandatory Measures

The Standards require that indoor and outdoor sign lighting be automatically controlled so that it is turned off during daytime hours and during other times when it is not needed. These controls must be certified by the manufacturer to the Energy Commission and listed in the Energy Commission directories. More detail on the mandatory measures is provided in Section 0.

In brief, the mandatory sign lighting requirements include:

- Automatic shutoff controls,
- Dimming controls, and
- Demand responsive controls for electronic message centers

All sign lighting controls must meet the requirements of §119 as applicable. The Sign Lighting Standards are the same throughout the state and are independent of outdoor Lighting Zones.

B. Sign Lighting Power

Sign Lighting Standards apply to both indoor and outdoor signs and contain two different prescriptive compliance options: Specific technology and watts per square foot approaches. The watt per square foot approach specifies a maximum lighting power that can be installed, expressed in W/ft² of sign area. The specific technology approach specifies that the signs shall be illuminated with efficient lighting sources (electronic ballasts, high efficacy lamps, efficient power supplies and efficient transformers). There are no performance compliance options available for sign lighting. Table 7-1 below summarizes the watts per square foot and specific technology sign compliance approaches. Detailed requirements are given in Section 7.3.

C. Responsibility for Compliance

The Standards include lighting control requirements for all illuminated signs (§133), and set limits on installed lighting power for internally illuminated and externally illuminated signs (§148).

The Mandatory Measures (sign lighting controls) are required for compliance with the Sign Lighting Standards. The same responsible person may install both the sign and the sign lighting controls, or separate responsible people may install the sign and the sign lighting controls.

A sign that complies with the installed lighting power requirements, but does not comply with the lighting control requirements does not comply with the Standards. The sign lighting controls must be installed for the sign to be in compliance with the Standards.

There are occasions when the sign installer is not licensed to install the sign lighting controls. For example, some sign installers have a C-45 license, which allows them to install the sign, but do not have a C-10 license to allow them to install the sign lighting controls. In such a case, it is the responsibility of the sign owner, general contractor, or architect to ensure that the sign complies with the lighting control requirements as well as the lighting power requirements.

If more than one person has responsibility for compliance, each responsible person shall separately prepare and sign a Certificate of Compliance, along with the imbedded Installation Certificate, applicable to the portion of construction for which they are responsible; alternatively, the person with chief responsibility for construction shall prepare and sign the Installation Certificate document(s) for the entire construction.

Table 7-1 – Sign Compliance Alternatives

Watts Per Square Foot Approach (See Section 7.3.1 for more information about the Watts Per Square Foot Approach)	
Type of Sign	Allowed Lighting Power
Internally Illuminated	12 W/ft ²
Externally Illuminated	2.3 W/ft ²
Specific Technology Approach (See Section 7.3.2 for more information about the Specific Technology Approach)	
<p>Signs illuminated by only the following light sources:</p> <ol style="list-style-type: none"> 1. High pressure sodium 2. Pulse-start or ceramic metal halide with a ballast efficiency $\geq 88\%$, per ANSI C82.6-2005 3. Pulse-start metal halide ≤ 320 watt, $\neq 250$ or 175 watt, and with a ballast efficiency $\geq 80\%$, per ANSI C82.6-2005 4. Neon and cold cathode with a transformer or power supply having: <ol style="list-style-type: none"> a. Efficiency $\geq 75\%$ with output current < 50 mA, or b. Efficiency $\geq 68\%$ with output current ≥ 50 mA, where efficiency is defined as the ratio of output wattage to input wattage at 100% tubing load 5. Fluorescent lamps with a minimum color rendering index (CRI) of 80 (Note: signs using linear florescent lamps with electronic ballasts may use lamps with a CRI of less than 80) 6. Light emitting diodes (LEDs) with a power supply efficiency $\geq 80\%$ EXCEPT LEDs powered with 120 volt AC to lower voltage AC or DC power supplies rated ≤ 250 watt must comply with Appliance Efficiency Regulations (Title 20) 7. Compact fluorescent lamps that do not contain medium based sockets. (E24/E26) 8. Electronic ballasts ≥ 20 kHz 	

7.1.5 Validating Compliance With an ENERGY VERIFIED Label

One option that may be used for validating that a manufactured sign complies with the installed lighting power requirements is to have a permanent, pre-printed, factory-installed ENERGY VERIFIED label. The ENERGY VERIFIED label shall indicate if the sign is complying with the maximum allowed lighting power method of compliance, or with the Specific Lighting Source method of compliance.

The only labels that will be recognized for this purpose are ENERGY VERIFIED Certification Marks authorized by Underwriters Laboratories (UL) or other Product Certification Body accredited to ISO/IEC Guide 65 by the American National Standards Institute in accordance with ISO/IEC 17011. Surveillance by the Accredited Certification Body shall be an ongoing annual inspection program carried out by a Type A Inspection body in accordance with ISO/IEC 17020.

The use of such ENERGY VERIFIED labels is not required.

The SLTG-1C (Certificate of Compliance, Sign Lighting) must always be filled out and signed whether an ENERGY VERIFIED label is used or not.

The Installation Declaration Statement must always be signed, AFTER the sign has been installed, whether an ENERGY VERIFIED label is used or not.

7.2 **Mandatory Measures**

The mandatory features and devices must be included in all sign lighting projects when they are applicable. These features have been proven to be cost-effective over a wide range of sign lighting applications. The mandatory measures require that the performance of sign lighting controls be certified by the manufacturers to the Energy Commission, and that sign lighting systems have controls for efficient operation. Mandatory measures for signs are specified in §119, §130, and §133. These are similar to the mandatory measures for indoor and outdoor lighting.

Mandatory Measures Note Block

If there are building plans, the person with overall responsibility must ensure that the Mandatory Measures that apply to the project are listed on the plans. The format of the list is left to the discretion of the Principal Designer.

Sample Notes Block – Sign Lighting Mandatory Measures

SIGN LIGHTING CONTROLS

- Controls for All Signs.** All signs with permanently connected lighting shall meet the requirements of Section 133.
- Automatic Time Switch Control.** All signs with permanently connected lighting shall be controlled with an automatic time switch control that complies with the applicable requirements of Section 119.
- Photocontrol or outdoor astronomical time switch control.** All outdoor signs shall be controlled with a photocontrol or outdoor astronomical time switch control unless exempted from the exceptions. See Section 133(a)2.
- Dimming.** All outdoor signs shall be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours unless exempted from the 5 possible exceptions. See Section 133(a)3.
- Demand Responsive Electronic Message Center (EMC) Control,** newly connected lighting power load greater than 15 kW shall have a control installed that is capable of reducing the lighting power by a minimum of 30 % when receiving a demand response signal that is sent out by the local utility.

7.2.1 Certification of Sign Lighting Controls

§119

Manufacturers of lighting control products shall certify the performance of their products to the California Energy Commission in accordance with the applicable provisions in §119. It is the responsibility of the designer, however, to specify products that meet these requirements. Code enforcement officials, in turn, check that the sign lighting controls specified are indeed certified.

The certification requirement applies to photocontrols, astronomical time switches, and automatic controls. Lighting control devices may be individual devices or systems consisting of two or more components, such as an Energy Management Control System (EMCS), many of these requirements are part of standard practice in California and should be well understood by those responsible for designing or installing the sign lighting.

All automatic sign lighting control devices must be certified by the manufacturer with the Energy Commission before they can be installed. Once a device is certified, it is listed in the Directory of Automatic Lighting Control Devices. Call the Energy Hotline at 1-800-772-3300 to obtain more information.

All control devices must have instructions for installation and start-up calibration, must be installed in accordance with such directions, and must have a status signal that warns of failure or malfunction. See Section 5.2.1.2 of the Nonresidential Compliance Manual for more information about certifying lighting controls.

7.2.2 Automatic Sign Lighting Controls

§133(a)1 and §133(a)2.

All signs, both indoor and outdoor, with permanently connected lighting shall be controlled with an automatic time switch control that complies with the applicable requirements of §119.

This means that an indoor sign must be controlled by at least an automatic time switch control. However, an astronomical time switch control may be used to comply with the automatic time switch control requirement for indoor signs because the astronomical time switch control exceeds the minimum required functionality of a simple automatic time switch control.

All outdoor signs shall be controlled with a photocontrol and/or a time switch control as follows:

Outdoor signs must be controlled by an automatic time switch control according to §133(a)1. Additionally, outdoor signs must be controlled by a photocontrol or outdoor astronomical time switch control according to §133(a)2. Therefore, an outdoor sign must be controlled by one of the following two options

1. An automatic time switch control in combination with a photocontrol, or
2. An outdoor astronomical time switch control.

Automatic time switch controls, photocontrols, and astronomical time switch controls used to meet these requirements must be certified by the manufacturer and listed in the Energy Commission directory.

Outdoor signs in tunnels and large covered areas that require illumination during daylight hours are not required to be controlled with a photocontrol or outdoor astronomical time switch control.

7.2.3 Dimming Controls

§133(a) 3.

All outdoor signs with permanently connected lighting must be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours.

The dimming control requirements do not apply to:

1. Signs that are illuminated for less than one hour per day during daylight hours.
2. Outdoor signs in tunnels and large covered areas that require illumination during daylight hours.
3. Metal halide, high pressure sodium, cold cathode, and neon lamps used to illuminate signs or parts of signs.

Controls used to meet these requirements shall be certified by the manufacturer and listed in the Energy Commission directory.

7.2.4 Demand Responsive Electronic Message Center Controls

§133(a) 4.

All electronic message centers (EMCs) with a new connected lighting greater than 15 kW must have a control capable of reducing the lighting power by at least 30 percent upon receiving a demand response signal sent by the local utility.

The demand responsive controls do not apply to EMCs required by a health or life safety statute, ordinance, or regulation, including but not limited to exit signs and traffic signs. The requirements apply to all other types of signs.

Example 7.2(a)**Question**

What are the mandatory sign lighting requirements for indoor signs?

Answer

The mandatory sign lighting requirements for indoor signs include:

1. An automatic time switch control that complies with the applicable requirements of §119.
2. Large indoor electronic message centers (EMC) (lighting power load > 15 kW) shall be capable of reducing lighting power \geq 30 percent when receiving a demand response signal sent out by the local utility. However, EMCs required by a health or life safety statute, ordinance, or regulation are not required to be controlled by a demand response.

Example 7.2(b)**Question**

What are the mandatory sign lighting requirements for outdoor signs?

Answer

1. The mandatory sign lighting requirements for outdoor signs include:
2. An automatic time switch control that complies with the applicable requirements of §119.
3. A photocontrol or outdoor astronomical time switch control.
4. All outdoor signs that are illuminated both day and night shall be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours.
5. Large outdoor electronic message centers (EMC) (lighting power load > 15 kW) shall be capable of reducing lighting power \geq 30 percent when receiving a demand response signal sent out by the local utility. However, EMCs required by a health or life safety statute, ordinance, or regulation are not required to be controlled by a demand response.

Example 7.2(c)**Question**

Are there any situations when a photocontrol or outdoor astronomical time switch is not required for outdoor signs?

Answer

Yes, photocontrols or outdoor astronomical time switch controls are not required for outdoor signs in tunnels and large covered areas that require illumination during daylight hours.

Example 7.2(d)

Question

How do I determine if an outdoor sign is illuminated both day and night so as to require the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours?

Answer

All outdoor signs that are illuminated at night, and for one of more hours per day during daylight hours, shall be considered to be illuminated both day and night.

Example 7.2(e)

Question

Are there situations when an outdoor sign that is illuminated both day and night is not required to be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during night-time hours?

Answer

Yes, following are the two exceptions when an outdoor sign that is illuminated both day and night is not required to be controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours:

1. Outdoor signs in tunnels and large covered areas that require illumination during daylight hours.
2. Metal halide, high pressure sodium, cold cathode, and neon lamps used to illuminate signs or parts of signs.

Example 7.2(f)

Question

What is the responsibility of the sign lighting designer with regard to using sign lighting controls that are certified to the Energy Commission and listed in the Energy Commission directories?

Answer

It is the responsibility of the manufacturer to certify the controls and to present the data to the Energy Commission so that it can be listed in the Energy Commission directories. It is the responsibility of the sign lighting designer to specify controls that have been certified and listed.

Example 7.2(g)

Question

Because the Standards require sign lighting to be controlled by an automatic time switch control, will a sign on the inside of a mall be required to be turned off during the day?

Answer

No, the signs will not be required to be turned off during the day. The automatic time switch control will allow the owner/occupant to program their signs to be automatically turned on and off in accordance with their particular needs.

7.3 Sign Lighting Energy Requirements

The Sign Lighting Standards apply to all internally illuminated (cabinet) signs, externally illuminated signs, unfiltered light emitting diodes (LEDs), and unfiltered neon, whether used indoors or outdoors. Examples are internally illuminated and externally illuminated signs, including billboards, and off-premise and on-premise signs.

§148 do not apply to unfiltered incandescent lamps that are not part of an electronic message center (EMC), internally illuminated sign, or an externally illuminated sign. In addition, §148 does not apply to traffic signs or exit signs. Exit signs and traffic signs must meet the requirements of the Appliance Efficiency Regulations (Title 20).

Even though the Standards take into consideration Outdoor Lighting Zones (OLZs) for outdoor lighting applications like parking lots, the Outdoor Sign Standards are the same throughout the state and are independent of Outdoor Lighting Zones.

§148 provide two alternative ways to comply with the Sign Lighting Standards. Both alternatives encourage the use of readily available, cost-effective lighting technology. The two alternatives are as follows:

1. **Alternative 1 - Watts Per Square Foot Approach.** This option sets the maximum power (watts) per ft² of sign. This approach allows sign makers maximum flexibility. It enables companies to introduce, develop and use any promising new lighting technology as long as it meets the power allowance. There are no constraints on the types of lighting equipment that a sign maker can use to comply under this approach, just as long the manufacturer does not exceed the maximum watts allowed for a sign of that size.

The maximum allowed lighting power is determined according to §148(a), and wattage must be determined according to the applicable provision of §130(d). §130(d) establishes how to determine lighting wattages depending upon the type of lighting technology used.

2. **Alternative 2 - Specific Technology Approach.** This option uses specific, energy-efficient lighting technologies. This option provides a simple specific technology approach for using these energy efficient technologies that are already being used by many in the sign industry.

The specific energy efficient lighting technologies are listed in §148(b).

7.3.1 Watts Per Square Foot Approach

§148(a) 1.

The first alternative for internally illuminated signs (watts per square foot approach) sets a maximum power allowance of 12 W/ ft² times the area of the sign face. For double-faced signs, only the area of a single face can be used to determine the allowed lighting power. However, for deep sign cabinets where the lamps are isolated by an opaque divider so that they illuminate only one sign face, or for irregular shaped signs where the faces are not parallel and the lamps are shielded by an opaque divider so that they illuminate only one sign face, then the total area of all of the sign faces can be used to determine the allowed lighting power. See Figure 7-1, Figure 7-2, and Figure 7-3.

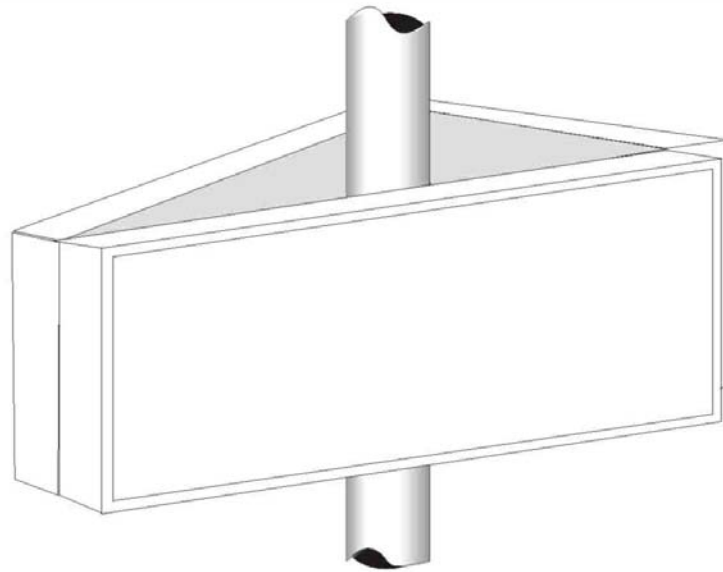


Figure 7-1 – Multi-faced sign

Include Area from Each Face When Separated by Opaque Divider

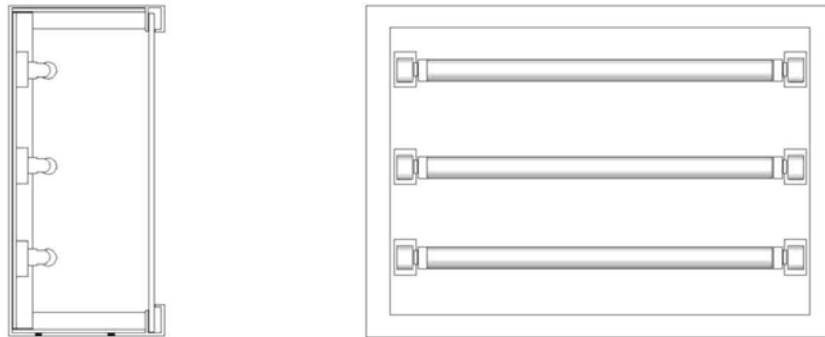


Figure 7-2 – Single-faced Internally Illuminated Cabinet Sign with Fluorescent Lamp and Translucent Face

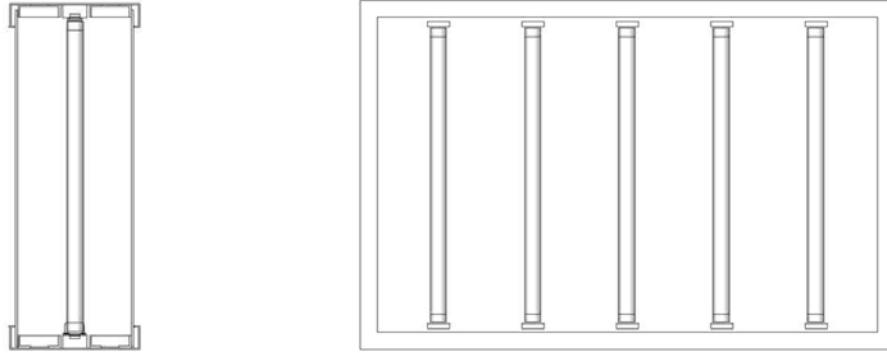


Figure 7-3 – Double-faced Internally Illuminated Cabinet Sign with Fluorescent Lamp and Translucent Faces

For externally illuminated signs the maximum allowed lighting power is 2.3 W/ft² times the area that is illuminated without obstruction or interference. One or more fixtures must illuminate the sign area. See §148(a)2.

Sign Lighting Installed Wattage

§130(d and e)

The installed lighting wattage in signs shall be determined in accordance with the applicable provisions of §130(d and e). Section 130(d and e) clarifies that wattage shall include the total lighting system, including wattage used by lamps, ballasts, transformers, and power supplies. The rules for determining lighting wattage are discussed in detail in Section 5.5, Calculating Lighting Power for Nonresidential Indoor Lighting.

7.3.2 Specific Technology Approach

§148(b)

The second alternative (specific technology approach) requires that the sign be illuminated only with one or more of the following light sources, as applicable:

1. High pressure sodium.
2. Pulse start or ceramic metal halide lamps served by a ballast that has a minimum efficiency of 88 percent.
3. Pulse start metal halide lamps that are 320 watts or smaller, are not 250 W or 175 W lamps, and are served by a ballast that has a minimum efficiency of 80 percent.

For pulse start and ceramic metal lamps, the Standards define ballast efficiency as the measured output wattage to the lamp divided by the measured operating input wattage when tested according to ANSI C82.6-2005.

4. Neon or cold cathode lamps with transformer or power supply efficiency greater than or equal to following:
 - a) A minimum efficiency of 75 percent when the transformer or power supply rated output current is less than 50 mA, or
 - b) A minimum efficiency of 68 percent when the transformer or power supply rated output current is 50 mA or greater.

For neon and cold cathode lamps, the Standards define power supply efficiency as the ratio of the output wattage to the input wattage is at 100 percent tubing load.

5. Fluorescent lamps with a minimum color rendering index (CRI) of 80.
6. Light emitting diodes (LEDs) with a power supply having an efficiency of 80 percent or greater.

For single voltage external power supplies that are designed to convert 120 volt AC input into lower voltage DC or AC output, and which have a nameplate output power less than or equal to 250 W, comply with the applicable requirements of the Appliance Efficiency Regulations (Title 20). See *Exception* to §148(b)5.

7. Compact fluorescent lamps that do not contain a medium base socket (E24/E26).
 8. Electronic ballasts with a fundamental output frequency not less than 20 kHz
- No other light sources can be used on a sign complying under this option.

An example of a non-compliant sign using multiple lighting technologies in a single sign, would be a sign using both electronic ballasts for linear fluorescent lamps and probe start metal halide lamps. Even though the electronic ballasts comply, probe start metal halide lamps are not included as one of the approved specific lighting sources. Therefore, a sign using any lighting technologies other than those listed below cannot use this method of compliance. Instead, they must use the maximum allowed lighting power method of compliance on Page 3 of 4.

Hybrid Signs

A sign may consist of multiple components, where some components are regulated, and some components are not regulated. For example, a single sign structure may have a regulated internally illuminated cabinet, plus regulated externally illuminated letters which are attached to a brick pedestal, plus unregulated unfiltered incandescent “chaser” lamps forming an illuminated arrow. For example, Figure 7-4 shows an arrow which is not part of an electronic message center (EMC) using incandescent lamps. If the lamps are not covered by a lens, then only the control regulations (§133) apply to the sign. This type of unfiltered incandescent sign is not regulated by §148.

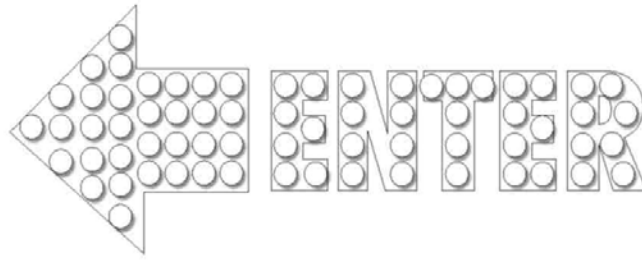


Figure 7-4 – Unfiltered Sign

Figure 7-5 shows an externally illuminated sign using flood lighting, which is regulated by the Standards. The power (wattage) used for these lighting components must comply with the watts per square foot approach, or use only lighting technologies approved according to §148(b).

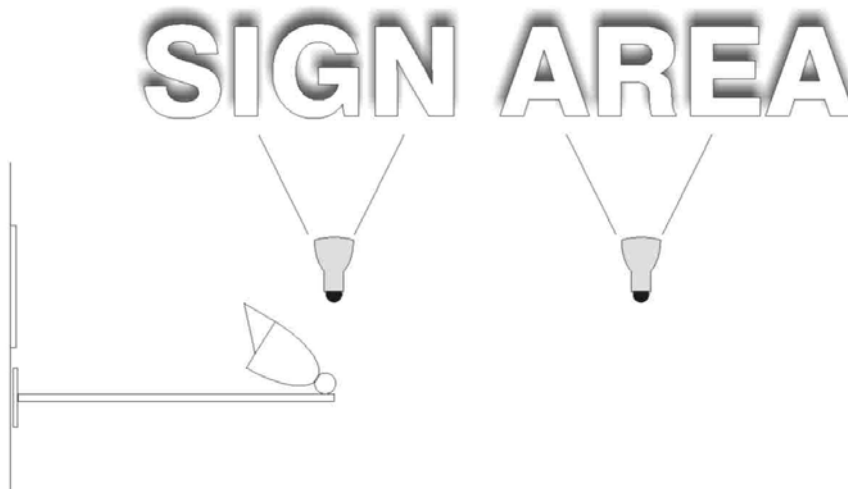


Figure 7-5 – Externally Illuminated Sign Using Flood Lighting

Example 7.3(a)

Question

Can I use neon or cold cathode lights in my sign and comply with the Standards under Alternative 2 (Specific Technology Approach)?

Answer

Yes, neon and cold cathode lights are allowed under the specific technology approach, provided that the transformers or power supplies have an efficiency of 75 percent or greater for output currents less than 50 mA and 68 percent or greater for output currents 50 mA or greater.

Example 7.3(b)

Question

Do signs inside a theater lobby or other indoor environments need to comply with the sign requirements?

Answer

Yes, all internally and externally illuminated signs whether indoor or outdoor must comply with either the specific technology or watts per square foot approach.

Example 7.3(c)

Question

My sign is equipped with both hardwired compact fluorescent lamps and incandescent lamps. Can my sign comply under the specific technology approach?

Answer

No. Since your sign is not exclusively equipped with energy efficient technologies allowed under the specific technology approach (incandescent sources are not allowed), it therefore must comply under the watts per square foot approach. Your other option is to replace the incandescent sources with an energy efficient option that is permitted under the specific technology approach, such as LED, pulse start or ceramic metal halide, or hard-wired CFL sources.

Example 7.3(d)

Question

My sign has three parts, an internally illuminated panel sign equipped with electronic ballasts, and two unfiltered 30 mA neon signs on top and bottom of the panel sign displaying an illuminated arrow equipped with power supplies with an efficiency of 76 percent. Do this sign comply with the specific technology approach?

**Answer**

Yes, this sign is essentially made up of three different signs; an internally illuminated panel sign equipped with electronic ballast that complies with the specific technology approach and two unfiltered neon signs with efficient power supplies also that comply with the specific technology approach. Therefore the entire sign complies with the Standards.

Example 7.3(e)

Question

Are signs required to comply with Outdoor Lighting Zone requirements?

Answer

No. Outdoor Lighting Zones do not apply in any way to signs. The Sign Lighting Standards are the same throughout the state; they do not vary with Outdoor Lighting Zones.

7.3.3 Additions and Alterations

§149(a) 1. §149(b)1H

All new signs, regardless of whether they are installed in conjunction with an indoor or outdoor addition or alteration to a building or outdoor lighting system, must meet the requirements for newly installed equipment, as required by §119, §130, §133 and §148.

7.3.4 Sign Alterations

§149(b)1 K

Existing indoor and outdoor internally illuminated and externally illuminated signs that are altered as specified by §149(b)1K are required to meet the requirements of §148. Altered components of existing indoor and outdoor internally and externally illuminated signs must also meet the requirements of §130(d)2, if Watts per square foot Approach is used for compliance.

The lighting power requirements (either specific technology or watts per square foot) are triggered by alterations to existing internally or externally illuminated signs when any of the following occurs as result of the alteration as specified in §149(b)1:

- The connected lighting power is increased.
- More than 50 percent of the ballasts are replaced and rewired.
- The sign is relocated to a different location on the same site or on a different site.

The lighting power requirements are not triggered when just the lamps are replaced, the sign face is replaced or the ballasts are replaced (without rewiring).

These signs must comply with either alternative (a) or alternative (b) of §148. Sign ballast rewiring that triggers the alterations requirements generally involves rewiring from parallel to series or visa versa, or when a ballast(s) is relocated within the same sign requiring relocating the wires. This does not include routine in-place ballast replacements.

Example 7.3(f)

Question

We are replacing 60 percent of the ballasts in a sign. Must we replace the remaining ballasts in the sign in order to comply with the Standards?

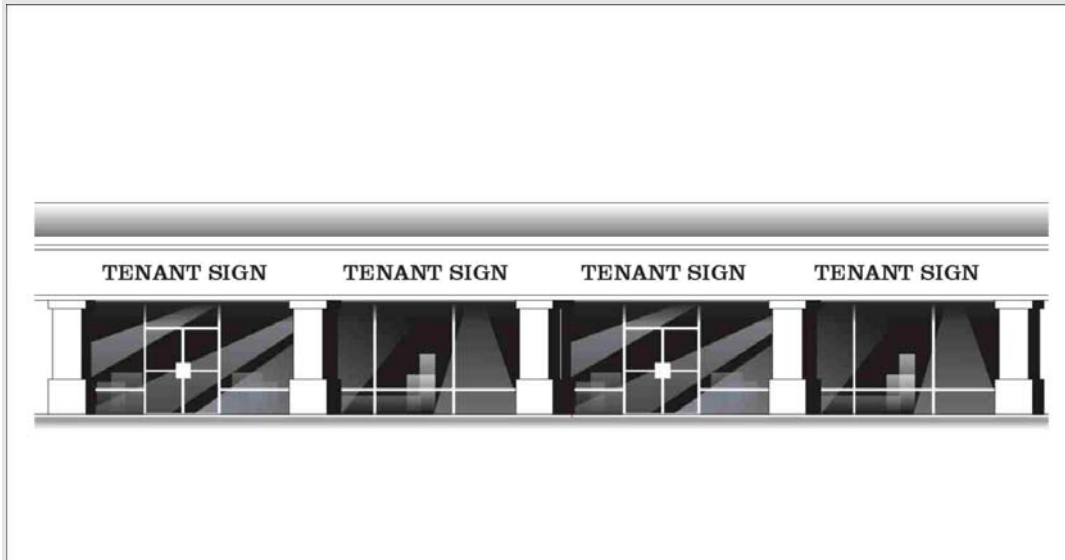
Answer

It depends. If more than 50 percent of the ballasts are being replaced, and the replacement involves rewiring the ballasts, then the alteration requirements apply to the whole sign. If more than 50 percent of the ballasts are being replaced during regular maintenance, and the ballasts are not being rewired, then the sign is not required to meet the Standards requirements. However, when existing wiring will allow the direct replacement of a magnetic ballast with a high efficiency high frequency electronic fluorescent ballast, even though Standards do not require the electronic ballast, the sign owner is encouraged to replace the magnetic ballasts with an electronic ballast.

Example 7.3(g)

Question

I have a strip mall full of signs. Must I immediately bring all of these signs into compliance even if I'm not going to alter them?

**Answer**

No, only those signs in which at least 50 percent of the ballasts are replaced and rewired, or those signs that are moved to a new location (on the same property or different property) must comply with either Alternative 1 or 2 of §148. Also, all newly installed signs must also comply with either Alternative 1 or 2.

7.4 Sign Lighting Plan Check Documents

At the time a building permit application is submitted to the enforcement agency, the applicant also submits plans and energy compliance documentation. This section describes the required forms and procedures for documenting compliance with the sign lighting requirements of the Standards. It does not describe the details of the requirements; these are presented in Section 7.1.4, Summary of Requirements. The following text is addressed to the designer preparing construction and compliance documents, and to the enforcement agency plan checkers who are examining those documents for compliance with the Standards.

For the 2005 Standards, the sign lighting compliance forms were located with a set of outdoor lighting compliance forms (OLTG). However, for the 2008 Standards, the sign lighting compliance forms are stand-alone forms (SLTG). The use of each part of the sign lighting compliance form is described below, and complete instructions for each part is presented in the following subsection.

7.4.1 SLTG-1C: Certificate of Compliance (Sign Lighting)

The SLTG-1C Certificate of Compliance form consists of five parts. A copy of these forms must be submitted to the enforcement agency at the time of building permit application. With enforcement agency approval, the applicant may use alternative formats of these forms (rather than the official Energy Commission forms), provided the information is the same and in a similar format.

The SLTG-1C set of compliance forms has the following five parts:

Part 1 - Certificate of Compliance Declaration Statement

Part 2 - Installation Certificate

Part 3 - Mandatory Sign Lighting Controls, including declarations as to who has responsibility for installing the signs, and who has responsibility for installing the sign lighting controls

Part 4 - Maximum Allowed Lighting Power Method of Compliance and Field Inspection Energy Checklists

Part 5 - Specific Lighting Source Method of Compliance and Field Inspection Energy Checklists

SLTG-1C Page 1 of 4**Project Description**

- PROJECT NAME is the title of the project, as shown on the plans and as known to the enforcement agency.
- DATE is the date of preparation of the compliance submittal package. It shall be on or after the date on the plans, and on or before the date on the building permit application.
- PROJECT ADDRESS is the address of the project as shown on the plans and as known to the enforcement agency.
- LOCATION OF SIGN shall be either Outdoor Sign or Indoor Sign.
- PHASE OF SIGN CONSTRUCTION indicates the status of the project described in the compliance documents. Check all that are appropriate:
 - ✓NEW SIGN shall be checked for newly installed signs.
 - ✓SIGN ALTERATION shall be checked for an alteration to an existing sign. (Note: Replacement of parts of an existing sign, including replacing lamps, the sign face, or ballasts that do not require rewiring, is not an alteration that is subject to the requirements of the Standards. However, when a sign is relocated, it is subject to the requirements of the Standards.)
- TYPE OF LIGHTING CONTROL indicates the status of the sign lighting controls described in the compliance documents. Check all that are appropriate:
 - ✓NEW LIGHTING CONTROLS shall be checked when installing new sign lighting controls where there had not been existing sign lighting controls.
 - ✓REPLACED LIGHTING CONTROLS shall be checked when replacing existing sign lighting controls with compliant sign lighting controls.
 - ✓NOT INSTALLING LIGHTING CONTROLS shall be checked when someone else is responsible to install the sign lighting controls, or when existing sign lighting controls are already compliant with the Standards.
- This Certificate of Compliance includes the following components (check all that apply):
 - ✓MANDATORY MEASURES (Sign Lighting Controls). Check this box if the person signing this Certificate of Compliance is responsible for installing compliant sign lighting controls. Page 2 of 4, parts 3(a) and (b), shall be filled out if this box is checked. Page 2 of 4, part 3(a) shall be filled out if this box is not checked.
 - ✓MAXIMUM ALLOWED LIGHTING POWER. Check this box if compliance for any signs in this Certificate of Compliance is achieved by the maximum allowed lighting power per square feet of sign compliance option. Page 3 of 4, Part 4 shall be filled out if this box is checked.
 - ✓SPECIFIC LIGHTING SOURCES. Check this box if compliance for any signs in this Certificate of Compliance is achieved using the Specific Lighting Source compliance option. Page 4 of 4, Part 5 shall be filled out if this box is checked.

SLTG-1C Part 1 Certificate of Compliance Declaration Statement

The Certificate of Compliance Declaration Statement is signed by the person responsible for the energy compliance documentation. The compliance documentation must be consistent with the plans. The person signing the Certificate of Compliance may be a C10, C45, or other person eligible under Division 3 of the California Business and Professions Code to accept responsibility for the sign compliance. The license number may be that of the contractor or other person eligible under Division 3. This person's telephone number is required to facilitate response to any questions that arise.

SLTG-1C Part 2 Installation Certificate

- Permit number and Checked by/Date are to be filled in only by the Enforcement Agency.

The Installation Declaration Statement may NOT be signed until after the components included in this Certificate of Compliance have been installed. This declaration statement is signed by the person responsible for installing the sign and/or sign lighting controls, consistent with the information listed in this Certificate of Compliance. If the installed sign or sign lighting controls are different than the information in this Certificate of Compliance, then a corrected Certificate of Compliance must be submitted. The person signing this may be a C10, C45, or other person eligible under Division 3 of the California Business and Professions Code to accept responsibility for the sign compliance. The license number may be that of the contractor or other person eligible under Division 3. This person's telephone number is required to facilitate response to any questions that arise.

The Business and Professions Code governs who is qualified to sign these declaration statements. See Chapter 2 of the *2008 Nonresidential Compliance Manual* for additional information.

SLTG-1C Page 2 of 4**SLTG-1C Part 3 Mandatory Sign Lighting Controls**

- PROJECT NAME and DATE are the same as those at the top of Page 1 of 4 of this Certificate of Compliance.

Part 3(a) Statements of Responsibility

Any person signing the Certificate of Compliance Declaration Statement on page 1 of 4 of this SLTG-1C shall complete Part 3(a), whether they are responsible for only the sign, only the lighting controls, or both. Yes or No must be checked for each of the following statements:

1. I have responsibility for installing the sign lighting controls.
✓ If Yes is checked here, complete both Parts 3(a) and 3(b) of this form.
✓ If No is checked here, complete only Part 3(a) of this form.
2. There are no existing sign lighting controls and I will be installing compliant sign lighting controls. A 'Yes' answer indicates that the person filling out this Certificate of Compliance is responsible for one of the following:
 - a) Only the sign lighting controls, or
 - b) Both the sign lighting controls and the sign lighting power requirements.
3. There are no existing sign lighting controls and someone else will be responsible to install compliant sign lighting controls. A 'Yes' answer indicates that the person filling out this Certificate of Compliance is responsible for only the sign lighting power requirements, and someone else will be responsible for the sign lighting controls.
4. There are existing sign lighting controls that do not comply with the applicable provision of §119 and §133 and I will be installing compliant sign lighting controls. A 'Yes' answer indicates that the person filling out this Certificate of Compliance is responsible for one of the following:
 - a) Only the sign lighting controls, or
 - b) Both the sign lighting controls and the sign lighting power requirements.
5. There are existing sign lighting controls that do not comply with the applicable provision of §119 and §133 and someone else will be responsible to install compliant sign lighting controls. A 'Yes' answer indicates that the person filling out this Certificate of Compliance is responsible for only the sign lighting power requirements, and someone else will be responsible for the sign lighting controls.

Part 3(b) Mandatory Sign Lighting Controls

If the person signing the Certificate of Compliance Declaration Statement on page 1 of 4 of this SLTG-1C is responsible for complying with the sign lighting control requirements, that person shall answer all of the questions in Part 3(b). If the person signing this Certificate of Compliance is not responsible for the sign lighting controls, then Part 3(b) is not required to be filled out.

- If there are construction documents, indicate where on the building plans the mandatory measures (sign lighting controls) note block can be located. This will help the plan checker locate the compliant controls on the plans.

The provided check boxes shall be completed as applicable to the project. Each row represents one of the mandatory controls requirements for signs. Check Yes (Y), No (N), or Not Applicable (NA) as appropriate for each of the rows below.

1. §133(a)1 for indoor signs:

- ✓'Y' indicates the person responsible for complying with the sign lighting control requirements shall install an automatic time switch control meeting the minimum requirements in Section 119(c) of the Standards.
- ✓'N' indicates the sign lighting controls do not comply with the Standards, therefore the sign is not in compliance with the Standards.
- ✓Check 'NA' only if the sign is an outdoor sign that is addressed in question number 2.

2. §133(a)(1 and 2) for outdoor signs:

- ✓'Y' indicates the person responsible for complying with the sign lighting controls requirements shall install one of the following control systems:
 - a) Both of the following controls: Automatic time switch control meeting the minimum requirements in Section 119(c) in addition to a photo control, or
 - b) Outdoor astronomical time switch meeting the minimum requirements in Section 119(i).
- ✓'N' indicates one of the following:
 - a) The sign lighting controls do not comply with the Standards, therefore, the sign is not in compliance with the Standards, or
 - b) Exception to 133(a)2 (below) has been checked 'Y'.
- ✓Check 'NA' only if the sign is an indoor sign addressed in question number 1

Exception to §133(a)2:

- ✓'Y' indicates the outdoor signs are in tunnels or large covered areas that require illumination during daylight hours, therefore the sign is not required to have the sign lighting controls required in Section 133(a)2.
- ✓'NA' indicates this exception is not applicable to the sign.

3. §133(a)3 for outdoor signs:

- ✓'Y' indicates the person responsible for complying with the sign lighting controls requirements shall install a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours.

- ✓ 'N' indicates one of the following:
 - a) The sign lighting controls do not comply with the Standards, therefore the sign is not in compliance with the Standards, or
 - b) One or more of the three Exceptions to §133(a)3, below, have been checked 'Y'.

✓ Check 'NA' only if the sign is an indoor sign addressed in question number 1.

Exception 1 to §133(a)3:

- ✓ 'Y' indicates the outdoor sign lighting is ON only at night.
- ✓ 'NA' indicates this exception is not applicable to the sign.

Exception 2 to §133(a)3:

- ✓ 'Y' indicates the outdoor signs are in tunnels or large covered areas that require illumination during daylight hours.
- ✓ 'NA' indicates this exception is not applicable to the sign.

Exception 3 to §133(a)3:

- ✓ 'Y' indicates that only metal halide, high pressure sodium, cold cathode, or neon lamps are used to illuminate the sign or parts of the sign.
- ✓ 'NA' indicates this exception is not applicable to the sign.

4. §133(a)4 Electronic Message Center

- ✓ 'Y' indicates the sign is an Electronic Message Center (EMC) having a new connected lighting power load greater than 15 kW and the person responsible for complying with the sign lighting controls requirements shall install a control that is capable of reducing the lighting power by a minimum of 30 percent when receiving a demand response signal.
 - ✓ 'N' indicates either the sign lighting controls do not comply with the Standards, or that the Exception to §133(a)4 below has been checked 'Y'.
 - ✓ Check 'NA' only if the sign is not an EMC
- Exception to §133(a)4**
- ✓ 'Y' indicates the sign is an EMC required by a health or life safety statute, ordinance, or regulation, including but not limited to exit signs and traffic signs.
 - ✓ 'NA' indicates this exception is not applicable to the sign.

The box on the bottom of this page, "Field Inspector Notes," is for use by the building inspector.

SLTG-1C Page 3 of 4**SLTG-1C Part 4 Maximum Allowed Lighting Power Method of Compliance**

There are two methods available for sign lighting compliance. One option is to install no more than the maximum allowed lighting power. The other option is to use only specific lightings sources.

Complete Page 3 of 4 if compliance is achieved using the maximum allowed lighting power per square foot of sign method of compliance. Do not fill out this page if there are signs using only the Specific Lighting Source method of compliance. Instead, complete part 5 (Page 4 of 4) of this Certificate of Compliance if there are signs using the Specific Lighting Source method of compliance.

This page serves two functions:

1. To document and certify when compliance is achieved using the maximum allowed lighting power per square foot of sign method of compliance, and
2. To be used by the enforcement agency as a field inspection energy checklist for sign lighting.

How to fill out this page:

- PROJECT NAME and DATE are the same as those at the top of Page 1 of 4 of this Certificate of Compliance.

Use a separate row for each sign.

- A. Enter the symbol or code used on the plans (when plans are required) and other documents.
- B. Enter a narrative description of the sign or the location of the sign on the building, and indicate the location of the sign on construction documents.
- C. OPTIONAL - Check this box only if this sign has a permanent, pre-printed, factory-installed ENERGY VERIFIED label, confirming that the sign complies with Section 148 of the California 2008 Title 24, Part 6 Standards, using the maximum allowed lighting power method of compliance. The only labels that will be recognized for this purpose are ENERGY VERIFIED Certification Marks authorized by Underwriters Laboratories (UL) or other Product Certification Body accredited to ISO/IEC Guide 65 by the American National Standards Institute in accordance with ISO/IEC 17011. Surveillance by the Accredited Certification Body shall be an ongoing annual inspection program carried out by a Type A Inspection body in accordance with ISO/IEC 17020.

For signs with such an ENERGY VERIFIED label, columns 'D' through 'H' are not required to be filled out.

Note: Using an ENERGY VERIFIED label is an optional method to validate compliance. The use of such an ENERGY VERIFIED label is not required for compliance.

The SLTG-1C (Certificate of Compliance, Sign Lighting) must always be filled out and signed whether an ENERGY VERIFIED label is used or not.

The Installation Declaration Statement must always be signed, AFTER the sign has been installed, whether an ENERGY VERIFIED label is used or not.

- D. Enter the sign area in square feet.
- E. Enter “I” if the sign is internally illuminated or “E” if the sign is externally illuminated.
- F. Enter the allowed watts per square foot. Enter 12 if the sign is listed as “I” in column E. Enter 2.3 if the sign is listed as “E” in column E.
- G. Enter the maximum allowed lighting power. Multiply the square footage in column D by the allowed Lighting Power Density (LPD = watts) in column F.
- H. Enter the total actual installed watts used for the sign, as determined according to the applicable provision of §130(d or e).
- I. Enter Y if the wattage entered in column H is less than or equal to the wattage entered in column G. Otherwise, the sign does not comply.
- J. This page doubles as a field inspection checklist. This column is reserved for the building inspector.

SLTG-1C Page 4 of 4**SLTG-1C Part 5 Specific Lighting Source Method of Compliance**

There are two methods available for sign lighting compliance. One option is to install no more than the maximum allowed lighting power. The other option is to use only specific lighting sources.

Complete Page 4 of 4 if compliance is achieved using the Specific Lighting Source method of compliance. Do not fill out this page if there are signs only using the allowed lighting power per square foot of sign method of compliance. Instead, complete Part 4 (page 3 of 4) of this Certificate of Compliance if there are signs using the allowed lighting power method of compliance.

This page two serves two functions:

1. To document and certify when compliance is achieved using the Specific Lighting Source method of compliance, and
2. To be used by the enforcement agency as a field inspection energy checklist for sign lighting.

How to fill out this page:

- PROJECT NAME and DATE are the same as those at the top of Page 1 of 4 of this Certificate of Compliance.

Use a separate row for each sign.

- A. Enter the symbol or code used on the plans (when plans are required) and other documents.
- B. Enter a narrative description of the sign or the location of the sign on the building, and indicate the location of the sign on the construction documents.
- C. OPTIONAL - Check this box only if this sign has a permanent, pre-printed, factory-installed ENERGY VERIFIED label, confirming that this sign complies with the Section 148 of the California 2008 Title 24, Part 6 Standards, using the Specific Lighting Source Method of Compliance. The only labels that will be recognized for this purpose are ENERGY VERIFIED Certification Marks authorized by Underwriters Laboratories (UL) or other Product Certification Body accredited to ISO/IEC Guide 65 by the American National Standards Institute in accordance with ISO/IEC 17011. Surveillance by the Accredited Certification Body shall be an ongoing annual inspection program carried out by a Type A Inspection body in accordance with ISO/IEC 17020.

For signs with such an ENERGY VERIFIED label, column 'D' is not required to be filled out.

Note: Using an ENERGY VERIFIED label is an optional method to validate compliance. The use of such an ENERGY VERIFIED label is not required for compliance.

The SLTG-1C (Certificate of Compliance, Sign Lighting) must always be filled out and signed whether an ENERGY VERIFIED label is used or not. The Installation Declaration Statement must always be signed, AFTER the sign has been installed, whether an ENERGY VERIFIED label is used or not.

- D. From the list below, enter numbers 1 through 10 as appropriate. The sign shall use only lighting technologies listed below to comply with the Specific Lighting Source method of compliance.
- 1 High pressure sodium lamps
 - 2 Pulse start or ceramic metal halide lamps served by a ballast with $\geq 88\%$ efficiency
 - 3 Pulse start metal halide lamps that are ≤ 320 watts, are not 250 watt or 175 watt lamps, and are served by a ballast with $\geq 80\%$ efficiency
 - 4 Neon or cold cathode lamps with transformer or power supply efficiency $\geq 75\%$ with rated output current < 50 mA
 - 5 Neon or cold cathode lamps with transformer or power supply efficiency $\geq 68\%$ with rated output current ≥ 50 mA
 - 6 Fluorescent lamps with a color rendering index (CRI) of ≤ 80 (Note: when using electronic ballasts for compliance, lamps with a CRI < 80 may be used)
 - 7 Light emitting diodes (LEDs) with a power supply with $\geq 80\%$ efficiency
 - 8 Single voltage LED external power supplies designed to convert 120 volt AC input into lower voltage DC or AC output, having a nameplate output power less than or equal to 250 watts, and certified to the Energy Commission as complying with the applicable requirements of the Appliance Efficiency Regulations (Title 20).
 - 9 Compact fluorescent lamps that do not contain a medium screw base socket (E24/E26)
 - 10 Electronic ballasts with a fundamental output frequency ≥ 20 kHz
- E. This page doubles as a field inspection checklist. Column E is reserved for the building inspector.

7.5 Lighting Inspection

The electrical building inspection process for energy compliance is carried out along with the other building inspections performed by the enforcement agency. The inspector relies upon the plans and upon the SLTG-1C Certificate of Compliance form.

No Acceptance Test is required.