

## 7. Sign Lighting

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### 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.

Sign lighting is addressed in this chapter.

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

#### 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. After the 2005 Standards, the Sign Lighting Standards were updated with the 2008 Standards.

The 2013 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

- A. The 2013 Sign Lighting Standards address both indoor and outdoor signs. The Standards include control requirements for all illuminated signs (§130.3), as well as establish lighting power requirements for internally illuminated and externally illuminated signs (§140.8).
- B. The Sign Lighting Standards are the same throughout the state and are independent of outdoor Lighting Zones.

### 7.1.3 Summary of Requirements

§110.9, §130.0, §130.3, §140.8 and §141

#### 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.

In brief, the mandatory sign lighting requirements include:

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

All lighting controls must meet the requirements of §110.9 as applicable. Most lighting controls must be certified by the manufacturer to the Energy Commission and required to be listed in the Energy Commission directories. Additionally, self-contained lighting control devices are now regulated by the Title 20 Appliance Efficiency Regulations. More details on the mandatory measures are provided in Section 7.2.

#### B. Sign Lighting Power

Sign Lighting Standards apply to both indoor and outdoor signs and contain two different prescriptive compliance options:

1. The watt per square foot approach specifies a maximum lighting power that can be installed, expressed in W/ft<sup>2</sup> of sign area.
2. 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).

More details on the sign lighting power requirements are provided in Section 7.3

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## 7.2 Mandatory Measures

The mandatory features and devices are required for all sign lighting projects as applicable. The mandatory measures require that lighting controls are certified by the manufacturers to the Energy Commission, and that sign lighting systems have controls for efficient operation. Mandatory features also set requirements for how lighting systems are classified according to technology, and how to calculate installed wattage. Mandatory measures for signs are specified in §110.9, §130.0, and §130.3. These are similar to the mandatory measures for indoor and outdoor lighting.

### 7.2.1 Mandatory Measures Note Block:

For projects that involve 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.

### 7.2.2 Certification of Self Contained Lighting Control Devices

§110.9

- A. A self-contained lighting control is defined by the Standards as a unitary lighting control module that requires no additional components to be a fully functional lighting control. Time-switch lighting controls, daylighting controls, photo controls, dimmers and occupant sensing controls may be self-contained lighting control devices.
- B. Manufacturers of self-contained lighting control devices shall certify their products to the California Energy Commission in accordance with the applicable provisions in §110.9, and with the Title 20 Appliance Efficiency Regulations. It is the responsibility of the designer or contractor, however, to specify products that meet these requirements. Code enforcement officials, in turn, shall check that the lighting control devices specified are indeed certified.
- C. Once a lighting control device is certified, it is listed in the Directory of Automatic Lighting Control Devices. Self contained lighting control devices that are not listed on the Energy Commission directory are not recognized as being certified by the manufacturer. Call the Energy Hotline at 1-800-772-3300 to obtain more information.

### 7.2.3 Installation of Lighting Control Systems

- A. Lighting control systems are defined by the Standards are those that require two or more components to be installed to provide all of the functionality required to make up a fully functional and compliant lighting control.
- B. In the previous versions of Part 6, lighting control systems were required to be certified to the Energy Commission in the same manner as self contained lighting control devices. However, in the 2013 Standards, lighting control systems are no longer required to be certified to the Energy Commission.
- C. Lighting control systems are not required to be certified by the manufacturer. Even though a lighting control system is not required to be certified to the Energy Commission, some individual components, such as a photo control, are required to be certified in accordance with the Title 20 Appliance Efficiency Regulations. Instead of certification of a lighting control system, the 2013 Standards require Installation Certificates to be submitted by the licensee of record, to be recognized for compliance with Part 6. An Installation Certificate shall be submitted for any lighting control system or Energy Management Control System as followings:
  - 1. Certification that when a lighting control system is installed to comply with lighting control requirements in Part 6 it complies with all applicable requirements of Part 6.
  - 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 Part 6.
- D. Demand responsive controls and equipment. Demand responsive controls and equipment shall be capable of receiving and automatically responding to at least one standards based messaging protocol which enables demand response after receiving a demand response signal.

#### 7.2.4 Sign Lighting Installed Wattage

§130.0(c).

The lighting wattage of signs shall be determined in accordance with the applicable provisions of §130.0(c). Note that the installed wattage of sign lighting is not considered when using the Alternate Lighting Source compliance option in §140.8(b).

Following are the most common sign lighting requirements for determining luminaire classification and power:

- A. The wattage of luminaires with line voltage lamp holders not containing permanently installed ballasts or transformers shall be the maximum relamping rated wattage of the luminaire;
- B. Screw-based adaptors shall not be used to convert an incandescent luminaire to any type of non-incandescent technology. Screw-based adaptors, including screw-base adaptors classified as permanent by the manufacturer, shall not be recognized for compliance with Part 6.
- C. The wattage of luminaires with permanently installed or remotely installed ballasts shall be the operating input wattage of the rated lamp/ballast combination published in ballast manufacturer's catalogs based on independent testing lab reports as specified by UL 1598.
- D. The wattage of luminaires and lighting systems with permanently installed or remotely installed transformers shall be the rated wattage of the lamp/transformer combination.
- E. The wattage of light emitting diode (LED) luminaires, and LED light engines shall be the maximum rated input wattage of the system when tested in accordance with IES LM-79-08.
  - o An LED lamp, integrated or non-integrated 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 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.

The rules for determining lighting wattage are discussed in greater detail in Chapter 5 of the Nonresidential Compliance Manual.

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## 7.3 Sign Lighting Control Requirements

### 7.3.1 Indoor Sign Lighting Controls

§130.3(a)1.

All indoor sign lighting is required to be controlled with an automatic time-switch control or astronomical time-switch control.

### 7.3.2 Outdoor Sign Lighting Controls

§130.3(a)2.

Outdoor sign lighting is required to meet the following requirements as applicable:

- A. All outdoor sign lighting is required to be controlled with one of the following two options:
1. A photocontrol in addition to an automatic time-switch control, or
  2. An astronomical time-switch control.

EXCEPTION to Section 130.3(a)2A

Lighting for the following outdoor signs is not required to be controlled by a photocontrol, automatic time-switch control, or astronomical time-switch control:

- Lighting for outdoor signs in tunnels, and for signs in large permanently covered outdoor areas that are intended to be continuously lit, 24 hours per day and 365 days per year.
- B. All outdoor sign lighting that is ON both day and night shall be controlled with a dimmer that provides the ability to automatically reduce sign lighting power by a minimum of 65 percent during nighttime hours.
- Signs that are illuminated at night and for more than 1 hour during daylight hours shall be considered ON both day and night.

EXCEPTION to Section 130.3(a)2B

Lighting for the following outdoor signs is not required to be controlled by dimmer:

- Lighting for outdoor signs in tunnels and large covered areas that are intended to be illuminated both day and night.

### 7.3.3 Demand Responsive Electronic Message Center Control

An Electronic Message Center (EMC) that has a new connected lighting power load of greater than 15 kW shall have a control installed that is capable of reducing the lighting power by a minimum of 30 percent when receiving a demand response signal.

EXCEPTION to Section 130.3(a)3

Lighting for an EMC that is not permitted by a health or life safety statute, ordinance, or regulation to be reduced by 30 percent is not required to be capable of reducing the lighting power when receiving a demand response signal.

#### Example 7-1

##### 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.

## **7.4 Sign Lighting Energy Requirements**

### **7.4.1 Scope of Sign Lighting Energy Requirements**

The Sign Lighting Energy Requirements 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.

### **7.4.2 Two Sign Lighting Energy Compliance Options**

There are two options available for complying with the sign lighting energy requirements:

- A. Maximum Allowed Lighting Power, or
- B. Alternate Lighting Sources

### **7.4.3 Applications Excluded from Sign Lighting Energy Requirements**

The following sign lighting applications are not required to comply with the sign lighting energy requirements. However, these exceptions do not apply to other applicable requirements of the Standards, unless also specifically excluded in that section of the Standards.

- A. Unfiltered incandescent lamps that are not part of an electronic message center (EMC), an internally illuminated sign, or an externally illuminated sign. This exception applies only to portions of a sign that are unfiltered incandescent lamps. An unfiltered sign is defined in the Standards as a sign where the viewer perceives the light source directly as the message, without any colored filter between the viewer and the light source. Although internally illuminated signs are mentioned in this exception, it is only those portions of a hybrid sign consisting of unfiltered incandescent lamps that are excluded from the sign lighting energy requirements.
- B. Exit signs. However, exit signs are required to meet the requirements of the Appliance Efficiency Regulations.
- C. Traffic Signs. However, traffic signs are required to meet the requirements of the Appliance Efficiency Regulations.

### **7.4.4 Maximum Allowed Lighting Power Compliance Option**

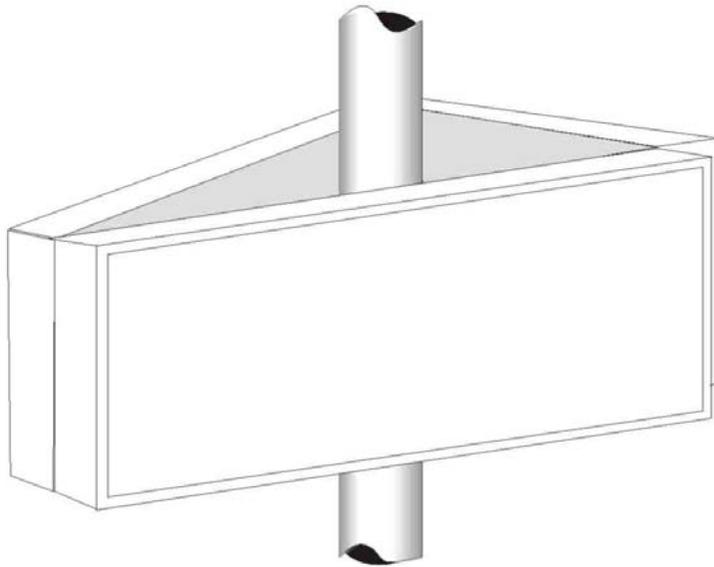
§140.8(a)

One of the two options for complying with the sign lighting energy requirements is the Maximum Allowed Lighting Power option, also known as the watts per square foot approach. When using this option, there are rules in the Standards for classifying the lighting technology used, and for determining sign lighting power. Additional information about Sign Lighting Installed Wattage is in section 7.2.3 of this chapter.

The maximum allowed lighting power is different for internally illuminated signs and for externally illuminated signs, as follows:

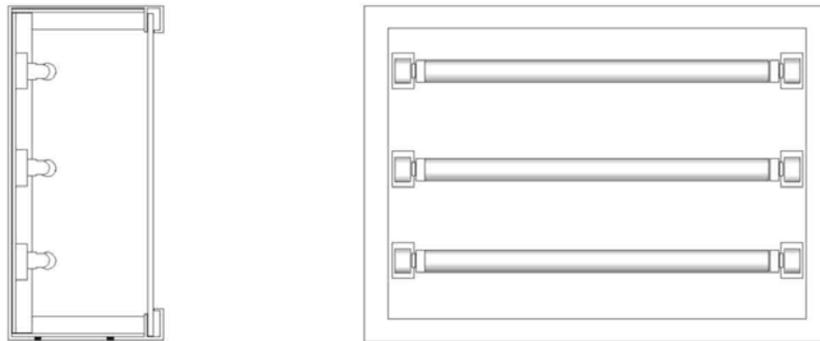
- A.** For internally illuminated signs, the maximum allowed lighting power is 12 watts per square foot of the illuminated sign area. For double-faced signs, only the area of a single face shall be used to determine the allowed lighting power.
  - Internally illuminated signs are defined in the Standards as signs that are illuminated by a light source that is contained inside a sign where the message area is luminous, including cabinet signs and channel letter signs.
- B.** For externally illuminated signs, the maximum allowed lighting power is 2.3 watts per square foot of the illuminated sign area. Only areas of an externally lighted sign that are illuminated without obstruction or interference, by one or more luminaires, shall be used.
  - Externally illuminated signs are defined in the Standards as any sign or a billboard that is lit by a light source that is external to the sign directed towards and shining on the face of the sign.

Lighting for unfiltered light emitting diodes (LEDs) and unfiltered neon are not required to comply with the maximum allowed lighting power option, but are required to comply with the alternate lighting source compliance method.

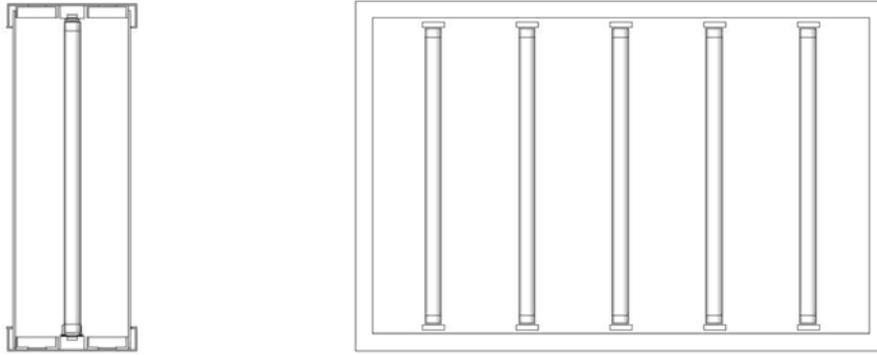


*Figure 7-1 – Multi-faced sign*

*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*

#### 7.4.5 Alternate Lighting Sources Compliance Option

§140.8(b)

The second of the two options available for complying with the sign lighting energy requirements is the Alternate Lighting Sources Compliance Option. When using this option, the rules for determining sign lighting power do not apply because there is no requirement to calculate lighting power with this option.

The sign complies with lighting energy requirements if it is equipped only with one or more of the following light sources:

- A. High pressure sodium lamps; or
- B. Metal halide lamps that are:
  1. Pulse start or ceramic served by a ballast that has a minimum efficiency of 88 percent or greater; or
  2. Pulse start that meet all of the following requirements:
    - a. Can only use metal halide lamps that are 320 watts or smaller, and
    - b. Cannot use a lamp that is 250 watts, and
    - c. Cannot use a lamp that is 175 watts,
    - d. And the lamps are served by a ballast that has a minimum efficiency of 80 percent.

Ballast efficiency is the measured output wattage to the lamp divided by the measured operating input wattage when tested according to ANSI C82.6-2005.

- C. Neon or cold cathode lamps with transformer or power supply efficiency greater than or equal to following:
1. A minimum efficiency of 75 percent when the transformer or power supply rated output current is less than 50 mA; or
  2. A minimum efficiency of 68 percent when the transformer or power supply rated output current is 50 mA or greater.
- The ratio of the output wattage to the input wattage is at 100 percent tubing load.
- D. Fluorescent lighting systems meeting one of the following requirements:
1. Use only lamps with a minimum color rendering index (CRI) of 80; or
  2. Use only electronic ballasts with a fundamental output frequency not less than 20 kHz.
- E. Light emitting diodes (LEDs) with a power supply having an efficiency of 80 percent or greater; or
- EXCEPTION to Section 140.8(b)5: Instead of requiring a power supply with an efficiency of 80 percent or greater, 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 watts, shall be certified to comply with the applicable requirements for external power supplies in the Appliance Efficiency Regulations (Title 20).
- F. Compact fluorescent lamps that do not contain a medium screw base sockets (E24/E26).

#### **7.4.6 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 (§130.3) apply to the sign. This type of unfiltered incandescent sign is not regulated by §140.8.

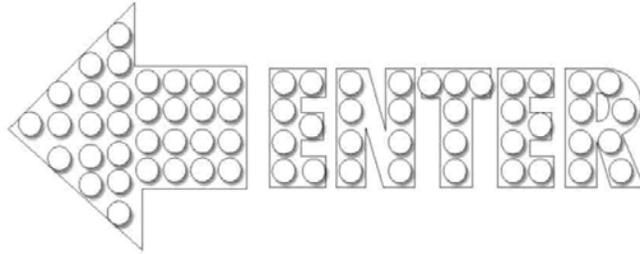


Figure 7-4 – Unfiltered Sign

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 §140.8(b).

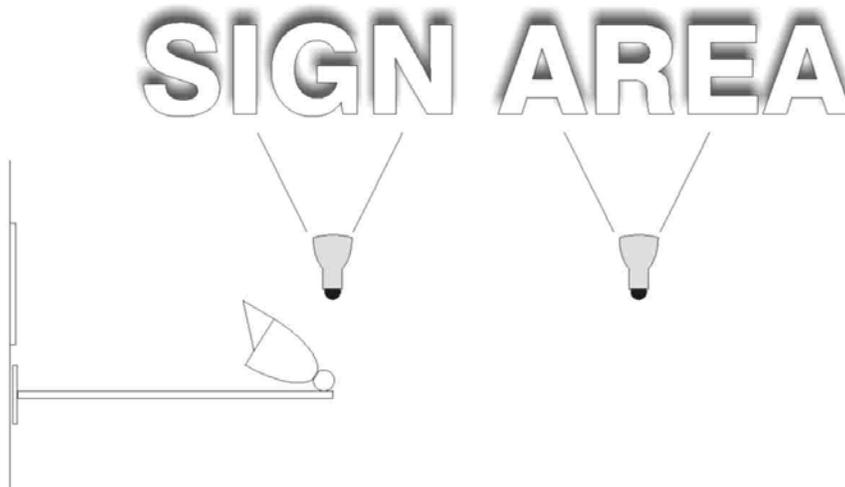


Figure 7-5 – Externally Illuminated Sign Using Flood Lighting

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**Example 7-2****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 alternate light source compliance option, 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****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 Maximum Allowed Lighting Power or Alternate Lighting Sources compliance option.

**Example 7-4****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 Alternate Lighting Sources compliance option (incandescent sources are not allowed), it therefore must comply under the Maximum Allowed Lighting Power compliance option. Your other option is to replace the incandescent sources with an energy efficient option that is permitted under the specific technology approach, such as hard-wired LED, pulse start or ceramic metal halide, or hard-wired CFL sources.

**Example 7-5****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?

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**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 7-6

**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.

## 7.5 Additions and Alterations

§141.0(a) 1. §141.0(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 §110.9, §130.0, §130.3 and §140.8.

### 7.5.1 Sign Alterations

§141.0(b)1 K

Existing indoor and outdoor internally illuminated and externally illuminated signs that are altered as specified by §141.0(b)1K are required to meet the requirements of §140.8. Altered components of existing indoor and outdoor internally and externally illuminated signs must also meet the requirements of §130.0.

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:

- A. The connected lighting power is increased.
- B. More than 50 percent of the ballasts are replaced and rewired.
- C. 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).

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.

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**Example 7-7****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?

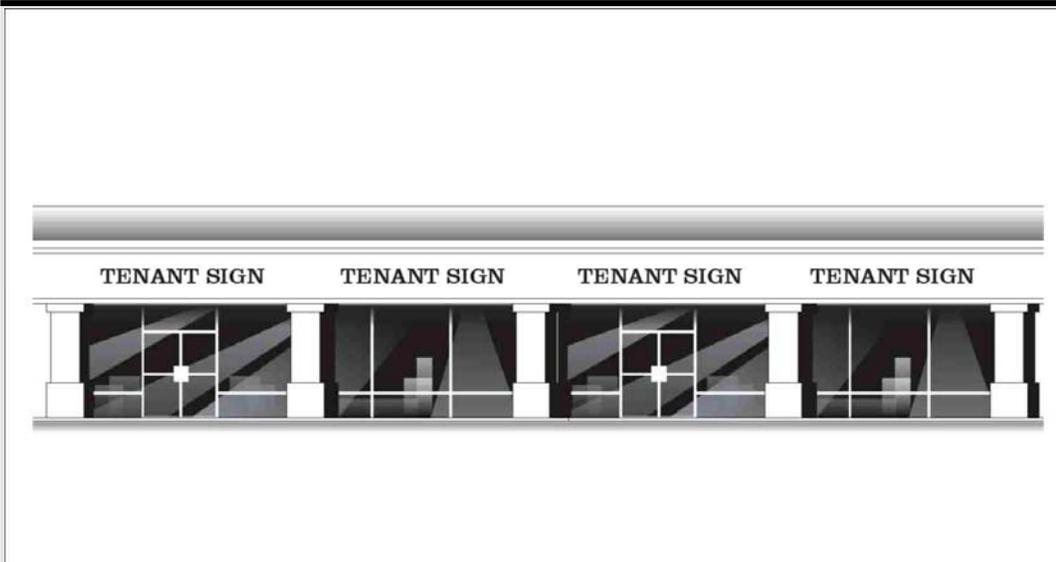
**Answer**

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 7-8****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?

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**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 the sign lighting energy requirements. Also, all newly installed signs must also comply with the sign lighting energy requirements.

## 7.6 Sign Lighting Plan Check Documents

***Note: the following instructions will not be updated until the new 2013 sign lighting compliance forms are updated.***

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 7.1.3, Summary of Requirements. The following discussion is addressed to the designer preparing construction documents and compliance, 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). There are only two parts to the 2008 sign lighting compliance forms, which can be printed as a single page, double-sided form for most sign lighting applications.

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.

### 7.3.1 SLTG-C: Certificate of Compliance (Sign Lighting)

The SLTG-C Certificate of Compliance form is in two 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.

#### SLTG-1C Page1 of 2

##### Project Description

- PROJECT NAME is the title of the project, as shown on the plans and known to the enforcement agency.
- PHASE OF CONSTRUCTION indicates the status of the project described in the compliance documents. Refer to Section 1.6 for detailed discussion of the various choices.
- NEW CONSTRUCTION shall be checked for all new signs installed with new construction..
- ADDITION shall be checked an additional new sign in an existing building.
- ALTERATION shall be checked for an alterations to an existing sign.
- FUNCTION TYPE indicates the purpose of the sign usage, either Outdoor Signs or Indoor Signs.
- DATE is the date of preparation of the compliance submittal package. It shall be on or after the date of the plans, and on or before the date of the building permit application.
- PROJECT ADDRESS is the address of the project as shown on the plans and as known to the enforcement agency.
- METHOD OF COMPLIANCE indicates the method of compliance used for the project.
- MAXIMUM ALLOWED LIGHTING POWER has a method for both internally and externally illuminated signs. This method generally allows for more sign power allowed.
- SPECIFIC LIGHTING SOURCES, this method is used for specific lighting applications. See §148(b) for a list of applications.

##### Declaration Statement of Documentation Author

DOCUMENTATION AUTHOR is the person who prepared the energy compliance documentation and who signs the Declaration Statement. The person's telephone number is given to facilitate response to any questions that arise. A Documentation

Author may have additional certifications such as an Energy Analyst or a Certified Energy Plans Examiner certification number. Enter number in the EA# or CEPE# box if applicable.

### **Declaration Statement of Principle Lighting Designer**

The Declaration Statement is signed by the person responsible for preparation of the plans for the sign and the documentation author. This principal designer is also responsible for the energy compliance documentation, even if the actual work is delegated to someone else (the Documentation Author as described above). It is necessary that the compliance documentation be consistent with the plans. The Business and Professions Code governs who is qualified to prepare plans and therefore to sign this statement. See Section 2.2.2 Permit Application for applicable text from the Business and Professions Code.

The person's telephone number is given to facilitate response to any questions that arise.

### **Mandatory Sign Lighting Controls**

The provided check boxes shall be completed as applicable to the project. Each row represents one of the mandatory controls requirements for signs, as the columns indicate whether the controls are installed.

Check yes or no:

**Row 1** – Must be checked “Yes” to document compliance for all signs.

**§133(a)1** - All signs with permanently connected lighting are controlled with an automatic time switch control that complies with the applicable requirements of §119.

**Row 2** – Only one of the following two check boxes must be “Yes” to document compliance for all signs  
**§133(a)2** - All outdoor signs are controlled with a photo control or outdoor astronomical time switch control.

**Exception to §133(a)2** - A photo control or outdoor astronomical time switch control is not required because the outdoor signs are in tunnels or large covered areas that require illumination during daylight hours.

**Row 3** – Only one of the following four boxes must be “Yes” to document compliance for all signs.

**§133(a)3** - All outdoor signs are controlled with a dimmer that provides the ability to automatically reduce sign power by a minimum of 65 percent during nighttime hours.

**Exception 1 to §133(a)3** - Outdoor signs are 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 because the signs are illuminated for less than one hour per day during daylight hours.

**Exception 2 to §133(a)3** - Outdoor signs are 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 because the signs are in tunnels or large covered areas that require illumination during daylight hours.

**Exception 3 to §133(a)3** - Outdoor signs are 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 because only metal halide, high pressure sodium, cold cathode, or neon lamps are used to illuminate signs or parts of signs.

**Row 4** – Both of the following rows must be checked either “Y”, “N”, or “N/A”. If the sign is an Electronic Message Center (EMC) having a new connected lighting power load greater than 15 kW, one of the following two rows must be checked “Y.” to document compliance.

**§133(a)4** - has a control installed is capable of reducing the lighting power by a minimum of 30 percent when receiving a demand response signal that is sent out by the local utility.

**Exception to §133(a)4** - A control is not required to reduce the lighting power by a minimum of 30 percent when receiving a demand response signal that is sent out by the local utility because the is required by a health or life safety statute, ordinance, or regulation, including but not limited to exit signs and traffic signs.

### SLTG-1C Part 2 of 2 Compliance Method

Part 2 of 2 of the SLTG-1C documents the compliance of sign lighting in accordance with §148. Page two serves two functions:

1. To document and certify the compliance method used, and
2. To be used by the enforcement agency as a field inspection energy checklist for sign lighting.

There are two compliance options for signs. Alternative 1 is based on complying with lighting power allowances per square foot of sign. Alternative 2 is based on utilizing only specific lighting technologies.

Unfiltered signs (signs consisting of bare incandescent lamps or bare neon tubing) are not regulated by §148. However, these signs are required to meet the mandatory control requirements in §133 as applicable. For hybrid signs, consisting of one or more components of internally illuminated, externally illuminated, and unfiltered components, each regulated component shall comply with Standards separately.

- PROJECT NAME is the title of the project. This name must match the information listed on SLTG-C Part 1 of 2.
- DATE must match the information listed on SLTG-C Part 1 of 2

### Fill in COLUMN A and COLUMN B for all signs, regardless of compliance method.

**A:** SIGN SYMBOL or code is the identifying designation of the system and shall be consistent with the plans

**B:** DESCRIPTION OR LOCATION is a narrative describing the system and its location as specified on the plans.

**Fill in COLUMNS C through H only for signs complying with the Maximum Allowed Lighting Power method.**

**C:** SIGN AREA is the area of the sign in square feet. Total all rows on the bottom row of this table.

**D:** INTERNALLY OR EXTERNALLY, list “I” if the sign is internally illuminated, or “E” if the sign is externally illuminated. If a sign has both internally and externally illuminated components, enter the sign components on separate lines.

**E:** ALLOWED LIGHT POWER DENSITY (LPD), depending if the sign or sign component is internally illuminated, enter “12” W/ft<sup>2</sup>, or enter “2.3” W/ft<sup>2</sup> if the sign or sign component is externally illuminated.

**F:** ALLOWED WATTS is the product of the SIGN AREA (column C) and the LPD (column E).

**G:** TOTAL INSTALLED WATTS is calculated total installed watts in the sign, as determined according to the applicable provisions of §130(d).

**H:** COMPLIES, the sign complies under the Maximum Allowed Lighting Power method if COLUMN F is smaller than COLUMN G, enter “Y”. If COLUMN G is larger than COLUMN F, enter “N”, the sign does not comply using this method. (However, the sign may still comply using the Alternative Light Source method if only approved technologies are used).

**K:** FIELD INSPECTOR either passes or fails the field inspection of the maximum allowed lighting power for that particular sign.

**Fill In COLUMN I only for signs complying with the Alternative Light Source method.**

In Column I, List a number from 1 through 10 as appropriate for each Alternative Light Source installed in the sign. Internally illuminated or externally illuminated signs which use any lighting technology not listed below shall not use this method for compliance, but must comply through the use of the Maximum Allowed Lighting Power method. List all numbers that apply from the list of compliant technologies shown below, for the sign shown on that row of the table:

High pressure sodium lamps

Pulse start or ceramic metal halide lamps served by a ballast with  $\geq 88$  percent efficiency

Pulse start metal halide lamps that are  $\leq 320$  W, are not 250 W or 175 W lamps, and are served by a ballast with  $\geq 80$  percent efficiency

Neon or cold cathode lamps with transformer or power supply efficiency  $\geq 75$  percent with rated output current  $< 50$  mA

Neon or cold cathode lamps with transformer or power supply efficiency  $\geq$  with rated output current  $\geq 50$  mA

Fluorescent lamps with a minimum color rendering index (CRI) of 80

Light emitting diodes (LEDs) with a power supply with  $\geq 80$  percent efficiency

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 W, and certified to the Energy Commission as

complying with the applicable requirements of the Appliance Efficiency Regulations (Title 20)

Compact fluorescent lamps that do not contain a medium screw base sockets (E24/E26)

Electronic ballasts with a fundamental output frequency  $\geq$  20 kHz

COLUMN J is reserved for the building inspector. The checkboxes provided are to indicate whether the project complies with either the Maximum Allowed Lighting Power method or the Alternative Light Source method.

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## 7.7 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-C Certificate of Compliance form.

No Acceptance Test is required.

