

Table 7-1 – Sign Compliance Alternatives

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

## 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 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**

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 Control (EMC),** 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 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 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 Sign Lighting Installed Wattage

#### §130(d).

The lighting wattage of signs shall be determined in accordance with the applicable provisions of §130(d). The rules for determining lighting wattage are discussed in detail in Section 5.5, Calculating Lighting Power for Nonresidential Indoor Lighting.