

# Special Specification 6411

## LED Internally Illuminated Street Name Signs



### 1. DESCRIPTION

Furnish, fabricate, and install light emitting diode (LED) internally illuminated street name (IISN) signs attached to traffic signal poles as shown on the plans or as directed.

### 2. MATERIALS

Provide new materials that comply with the details shown on the plans or as the directed, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 445, "Galvanizing"
- Item 446, "Field Cleaning and Painting Steel"
- Item 620, "Electrical Conductors"
- Item 621, "Tray Cable."

Furnish and fabricate LED IISN sign assemblies and associated mounting hardware from new materials that comply with this specification. Provide single side message or double side message signs as shown on the plans or as directed.

Furnish 6 sets of submittals, of the LED IISN and mounting hardware, to the Engineer at the project address. Do not begin work or purchase materials before the submittals are approved by the Engineer.

- 2.1. **General Requirements.** Ensure sign assembly standard lengths are between 4 ft. and 10 ft. Ensure standard viewable heights are between 15 in. and 30 in. Use single or double-faced signs as required by plans. Ensure maximum weight of the sign does not exceed maximum capacity of IISN support arms.

Construct sign fixture housing from 5000 or 6000 series aluminum. Powder-coat paint all exterior fixture housing glossy black or as shown on the plans or as directed. Ensure paint exceeds 1000-hr. salt-spray test in accordance with ASTM B117. IISN housing must be rated as NEMA type 3R. Use stainless steel screws and hardware.

Ensure sign panels, light sources, light engines, and power supplies can be replaced without sign removal. The sign must be capable of continuous operation over a range in temperatures from -10°F to +140°F.

- 2.2. **LED Requirements.** Provide high flux LED's that are rated to maintain a minimum 70% of their initial lumens after 60,000 hr. according to IESNA LM-80-08. Ensure the LED arrays or modules will continue to operate if one LED goes out. Provide light engine and LED arrays or modules that are replaceable without removing the sign.

- 2.3. **Sign Panel Requirements.** Ensure the front panel of the sign is ultraviolet, weather, abrasion, and impact resistant high impact strength polycarbonate, acrylic or a glass-fiber reinforced polyester fluoride. The front panel will be replaceable for future maintenance purposes. Provide translucent reflective type D sheeting and colored transparent acrylic film as per TxDOT DMS-8300, "Sign Face Material."

As per Texas Manual on Uniform Traffic Control Devices Section 2D.38, street name signs will have a white legend on a green background. A border, if used, will be the same color as the legend. The lettering should be at least 8 in. capital letters, or upper/lower case letters. Supplementary lettering to indicate the type of street (such as Street, Avenue, or Road) or the section of the City (such as SE) may be in smaller lettering,

at least 3 in. high. Ensure letter font type is Clearview - 3W as shown on *Standard Highway Sign Designs for Texas*, D3-1 Overhead Mount.

- 2.4. **Electrical and Illumination Requirements.** Provide IISN that will operate at 120 VAC. Ensure product meets standard for electric signs UL 48. The on-board circuitry of an IISN must include voltage surge protection, to withstand high-repetition noise transients and low-repetition high-energy transients as stated in Section 2.1.8, NEMA Standard TS 2-2003. The power supply must be housed inside the sign enclosure. Power supply must be UL Class 2 limited output voltage and current plus isolation for safe operation, and UL rated for outdoor damp locations. Power supply will be IP 64 Outdoor Rated. The light source must evenly illuminate the sign panel. The average luminance over the entire panel surface will be uniform.

- 2.5. **Support Requirements.** The sign must be designed and constructed to withstand 110 mph wind loads in conformance with the requirements of the AASHTO publication *Standard Specifications for Structural Supports of Highway Signs, Luminaires and Traffic Signals* (5th Edition 2009).

The sign must be supplied with mounting brackets from the manufacturer (swinging or rigid mounting) as shown on the plans or as directed.

- 2.6. **Color.** The color of the legend, symbols, and background must fall within the CIE (The International Commission on Illumination) color coordinates and reflectance values listed in Table 1.

Table 1  
CIE Chromaticity Coordinates and Reflectance Values

White			Green		
x	y	Reflectance	x	y	Reflectance
0.300	0.290	40 Min	0.255	0.330	3.5-10
280	0.310		0.255	0.520	
0.360	0.360		0.020	0.540	

- 2.7. **Workmanship.** The panels must exhibit good workmanship and must be free from objectionable marks or defects that would adversely affect appearance or serviceability.
- 2.8. **Warranty.** The manufacturer will replace failed IISNs, when non-operable due to defect in material or workmanship, within five years of installation with a new IISN that passes all testing, delivered and installed at the project location.

---

### 3. CONSTRUCTION

Fabricate and install internally illuminated street name signs in accordance with the details and dimensions shown on the plans, specified, or as approved by the Engineer. Install in accordance with the latest Electrical Detail Standards. Install signs level and plumb brackets or clamps. Attach IISN to traffic signal poles as per manufacturer's instructions or as shown on the plans or as directed.

Use established industry and utility safety practices when installing IISNs located near overhead or underground utilities. Consult with the appropriate utility company before beginning work.

Prevent scarring or marring of the poles, mast arms, and IISNs. Replace damaged components. Repair damaged galvanizing in accordance with Section 445.3.5, "Repairs." Repair damaged painted areas of a roadway illumination assembly in accordance with Item 446, "Field Cleaning and Painting Steel."

---

### 4. MEASUREMENT

This Item will be measured as each LED IISN sign installed.

---

**5. PAYMENT**

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement," will be paid for at the unit bid price for "LED Internally Illuminated Street Name Signs" of the sizes and types specified. This price is full compensation for furnishing, fabricating and installing the signs; support arm clamp assembly; liquid tight flexible metal conduit; and equipment, labor, tools, and incidentals.

New conduit will be paid for under Item 618, "Conduit." New conductors, except the conductors internal to the pole, will be paid for under Item 620, "Electrical Conductors." New tray cable, except the tray cable internal to the pole, will be paid for under Item 621, "Tray Cable."