MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
LONG LIFE LIGHT EMITTING DIODE TRAFFIC SIGNAL

SIG:EMS   1 of 2   APPR:NJB:HLO:11-17-23
FHWA:APPR:11-21-23

a. Description. This work consists of installing long life LED traffic signals. Adhere to the standard specifications for all other requirements for traffic signals not specifically listed in the requirements of this special provision.

b. Materials. Ensure materials are in accordance with sections 918 and 921 of the Standard Specifications for Construction, the *MMUTCD* and the requirements of this special provision.

1. LED Module. Furnish LED modules consisting of high flux LEDs mounted on a metal core circuit board and LED electrical contacts soldered to the circuit board. Furnish all power supplies with conformal coating for additional protection and solid connections (no connectors) between driver and LED light engine. Furnish non-electrolytic capacitors to enhance long life.

Furnish green LEDs that use indium gallium nitride technology. Furnish green LED traffic signal modules that do not illuminate if the applied voltage is less than 35 VAC.

Furnish yellow LEDs that use indium gallium nitride technology, absorbing substrate or transparent substrate. Furnish yellow LED traffic signal modules that do not illuminate if the applied voltage is less than 35 VAC.

Furnish LED modules for traffic signals with the following maximum power consumption:

A. Eight inch and 12-inch red ball traffic signal modules with a maximum power consumption no greater than 8 watts and 9 watts respectively, at 120 VAC, at 77 °F;

B. Eight inch and 12-inch yellow ball traffic signal modules with a maximum power consumption no greater than 8 watts and 13 watts, respectively, at 120 VAC, at 77 °F;

C. Eight inch and 12-inch green ball traffic signal modules with a maximum power consumption no greater than 7 watts and 9 watts, respectively, at 120 VAC, at 77 °F;

D. Twelve inch red arrows with a maximum power consumption no greater than 7 watts at 120 VAC, at 77 °F;

E. Twelve inch yellow arrows with a maximum power consumption no greater than 14 watts at 120 VAC, at 77 °F; and

F. Twelve inch green arrows with a maximum power consumption no greater than 9 watts at 120 VAC, at 77 °F.

2. Lens.   Furnish an LED signal module lens made from UV-stabilized polycarbonate. Use lenses that are color tinted red, yellow, and green. Furnish a hard-coated lens or a lens that otherwise complies with the material exposure and weathering effects requirements of *SAE J576*.

For arrows incorporate a black arrow mask behind the outer lens to define the arrow icon. Furnish an outer lens with raised optical detail on the inner surface to distribute the light rays to meet the intensity and distribution standards required by this subsection.

3. Operational Requirements.   Furnish LED traffic signal modules that meet the minimum intensity requirements while operating from temperatures of -40 °F to 165 °F for 15 years.

4. Warranty.   Furnish materials with a manufacturer's warranty, transferable to the MDOT, that the supplied materials are free from all defects in materials and workmanship. Furnish the warranty and other applicable documents from the manufacturer, and a copy of the invoice showing the date of shipment, to the Engineer prior to acceptance.

c. Construction. Furnish and install the long life LED traffic signals as shown on the plans or as directed by the Engineer. All work must comply with sections 819 and 820 of the Standard Specifications for Construction and this special provision. Storage and/or disposal of removed material is included and must comply with section 204 of the Standard Specifications for Construction or as directed by the Engineer.

Install, direct, and mask the signal indication(s) in accordance with the manufacturer's recommendation and the visibility requirements as directed by the Engineer.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

Pay Item	**Pay Unit**
TS, __ Way __ Mtd (LED), Long Life	Each
TS, __ Way __ Mtd, __ (LED), Long Life	Each