STATE OF NEW JERSEY
DEPARTMENT OF TRANSPORTATION
TRENTON, NEW JERSEY 08625

SPECIFICATIONS FOR A LED (LIGHT EMITTING DIODE) BI-MODAL TURN ARROW MODULE

N.J. Specification No. EB-LED-BTAM Effective Date: July 1, 2001

The New Jersey Department of Transportation Specification for a LED (Light Emitting Diode) Bi-modal turn arrow signal module.

It is the purpose of this specification to describe minimum acceptable requirements for a LED (Light Emitting Diode) Bi-modal turn arrow signal module.

GENERAL - I

1-1 The bi-modal turn arrow signal module shall conform to the following:

A. Manual on Uniform Traffic Control Devices (MUTCD).

B. Applicable provisions of the current specification of the Institute of Transportation Engineering (ITE) standard titled Vehicle Traffic Control Signal Heads – Part 2: Light Emitting Diode (LED) Vehicle Traffic Signal Modules (VTCSH Part 2).

C. FCC Title 47, Subpart B, Section 15 on the Emission of Electronic Noise.

The manufacturer must supply certification, which includes a copy of the test report by an independent technical laboratory as to the module compliance with ITE specifications (where it applies). The report shall also indicate that the tests were performed only after the module received a thirty (30) minute operational warm-up period immediately preceding the tests.

CONSTRUCTION - II

2-1 The LED module shall consist of displaying two indications in the same housing. One indication shall be a green arrow and the other indication shall be amber arrow. Each indication shall display separately and never concurrently. Each indication shall point in the same direction. No moving parts shall be permitted to change the display. Both indications shall be bright in color with a flat background. The displays shall be made from a double row of LEDs.

2-2 The LED module shall replace the reflector, socket, gasket and lens assembly of the incandescent signal indication as specified in current New Jersey Department of Transportation Specification EB-TS-1 "Specification for Adjustable Face Vehicle Traffic Control Polycarbonate Signal Head".

2-3 The LED module shall be watertight when properly mounted in the traffic signal housing and shall not allow the ingress of water into any section of the traffic signal assembly. A continuous soft rubber or silicone gasket completely surrounding the unit shall be provided with each unit.

2-4 The LED's and required circuit components shall be encased in a rigid housing for protection in shipping, handling and installation.

2-5 The lens shall be ultraviolet stabilized material. The lens color shall be clear or uniformly tinted, provided the tinting does not affect the intensity or chromaticity. If polycarbonate material is used, the lenses must have a protective coating for scratch resistance.

2-6 Gallium Nitride LED's (green arrow) and Aluminum Indium Gallium Phosphorus LEDs (amber arrow) shall be utilized.

2-7 The design and chromaticity must comply with ITE St-008B specification.

2-8 The viewing angle of the LED module shall not be less than 55 degrees horizontally and 17.5 degrees vertically. The LED module shall be capable of being used for left or right aiming, with the same vertical angle in either direction.

2-9 The LED module must be certified to have passed the Environmental Simulation Vibration Test (MIL-Std 883 Method 2007).

Electrical - III

3-1 The LED module shall connect directly to the line voltage, 120 volts nominal, and shall be able to operate over the voltage range of 80-130 volts A.C. The variation in line voltage shall not cause the light intensity to vary by more than 10% over the entire operating voltage range.

3-2 A 12 inch nominal arrow shall not consume more than 12 Watts.

3-3 The LEDs shall operate over the temperature range of -40 °F to +165 °F.

3-4 The forward current, as measured through each LED, shall not exceed 60% of the LED manufactures maximum current rating when operating at +77 °F.

3-5 The LEDs shall not emit visible light when subjected to a 120 volt AC, 4 milliamp leakage current from a NEMA solid state load switch. (load switch in the off state)

3-6 Transient voltage suppression/protection shall be provided internal to the LED module to minimize the possibility of damage due to extreme over voltage.

3-7 The LED module shall be supplied with three conductors one (1) foot in length for each connection to the terminal board of the traffic signal indication. Each conductor shall be 600 volt, stranded No. 20 AWG minimum copper wire, rated for service at +221 °F, capable of withstanding all adverse effects of moisture, corrosive atmosphere and temperatures associated with the operation of the signal head. Spade lugs shall be installed on the ends of each conductor. The spade lugs must be capable of fitting under M4 screws.

INSTRUCTION AND GUARANTEES - IV

4-1 Upon request, one schematic wiring diagram and installation manual shall be provided with each LED module.

4-2 No changes or substitutions in these requirements will be accepted unless authorized in writing. Inquires regarding this specification shall be addressed to the Manager, Office of Traffic Signal and Safety Engineering, New Jersey Department of Transportation, 1035 Parkway Avenue, P.O. Box 613, Trenton, New Jersey 08625.

4-3 LED signal modules shall be replaced or repaired if an LED signal module fails to function as intended due to workmanship material defects within the first 60 months from the date of delivery.

4-4 The company agrees upon the request of the Manager, Office of Traffic Signal and Safety Engineering to deliver a sample of the LED module to be supplied in compliance with these specifications for test before acceptance. After completion of the test, the sample shall be returned.