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REVISION OF SECTION 614

LIGHT EMITTING DIODE (LED) IN-PAVEMENT MARKINGS

Section 614 of the *Standard Specifications* is hereby revised for this project to include the following:

**DESCRIPTION**

The work consists of furnishing and installing Light Emitting Diode (LED) In-Pavement Markings at locations as shown on the plans. Spare pavement markings shall become the property of the Department and shall be delivered to a CDOT Maintenance Facility as directed. The work shall include furnishing and installing the attached LED mounting plates, all necessary induction connectors, hardware, adhesive, and materials required for the proper operation of the LED lighting units.

This work also consists of the installation of master controllers for the LED In-Pavement Markings as shown on the plans and in accordance with manufacturer’s recommendations.

**MATERIALS**

The semi-directional LED pavement marking units shall be both for yellow and white lines, and shall be LEDline manufactured by:

HIL-Tech, Ltd.

2119 Devon Road

Oakville, Ontario L6J 5L9

905 849-6134 Fax 905 842-7418

Email: nhutchins@cogeco.ca Nick Hutchins, President

The LED pavement markings shall be LED Model #’s LL-DV00-0002Y-12 (Yellow) and LL-DV00-0002W-12 (White). Each LED pavement marking model shall include:

1. Induct induction connector Model # LL-CT00-0002-12
2. IP-68 Waterproof Connector
3. LEDline Aluminum mounting Plate Model # LLMount

The Master Controller (MC) shall be Model # LL-PSMC-0200 as manufactured by HIL-Tech, Ltd., and shall include:

1. 8 Power Modules installed & wired into the master controller

The Contractor shall also provide the following:

1. Two ambient light photo-electric sensors
2. All installed wiring and conduit

Adhesive material for LED pavement markings shall be in accordance with manufacturer’s recommendations.

**CONSTRUCTION REQUIREMENTS**

A manufacturer’s representative shall be on site during the completion of this work to ensure proper installation.

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The Contractor shall do a ground layout of the LED pavement markings and power feed wiring system on the ground using paint prior to any saw cuts. The Contractor shall submit a layout of the pavement markings, controllers, and wiring to the Engineer for approval. The layout shall approximate the locations of the LED system at final installation, unless otherwise directed. Actual installation of the in-pavement markings and power feed wiring shall not begin until approval has been received.

1. *LED In-line Pavement Markings.*

Each LED pavement marking surface shall be set ¼ inch below the asphalt surface. No excess adhesive shall be left on the LED surface or on the highway. Each unit shall be tested individually prior to and immediately after installing in the pavement. Inoperative LEDs shall be repaired or replaced at the Contractor’s expense.

After installation of all units, the system shall be immediately tested for functionality with an acceptable power source as supplied by the Contractor. Optimum continuity shall be maintained, and resistance values shall be the same as those measured prior to wire installation

Flexible adhesive shall be applied in accordance with manufacturer’s recommendations.

The Contractor shall install power feed wiring from the power source to each MC and from the MC’s to each pavement marking power line, as shown on the plans.

If adjacent pavement marking is called for in the plans, the roadway shall be power washed and power broomed prior to painting. LED’s shall be temporarily covered to prevent paint overspray onto the LED covers.

1. *Master Controller.*

The contractor shall mount the MC at the location shown on the plans, at a suitable height above the ground, considering expected snow levels. The MC shall be bolted securely, using Contractor supplied hardware.

Photocells shall be mounted as shown on the plans.

The contractor shall install any grounds or ground rods as necessitated by the applicable codes.

1. *Manuals.*

Two sets of bound operation and maintenance manuals shall be obtained from the manufacturer and submitted to the Engineer. The manuals shall, as a minimum include:

1. Complete and accurate schematic diagrams and as-built drawings showing the location of LED units and all wiring saw cuts and conduits.
2. Complete installation and repair procedures.
3. Complete parts list including names of vendors for parts not identified by universal part numbers such as JEDEC, RETMA or EIA
4. Pictorial of component layout in master controller cabinet.
5. Specifications of all connectors.
6. Complete maintenance and troubleshooting procedures.
7. Complete step-by-step explanation of allowable adjustments for brightness and power settings.
8. In-cabinet wiring diagram of each MC.

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1. *Training.*

The manufacturer’s representative shall provideon-site training for maintenance personnel on maintaining and replacing components of the LED and MC. Training may be partially inside at a training facility arranged by the Department and partially outside at the project site.

**METHOD OF MEASUREMENT**

LED pavement markings will be measured by the actual number of pavement markings that are installed and accepted.

Master controllers will be measured by the actual number of controllers that are installed and accepted.

**BASIS OF PAYMENT**

Payment will be made under:

**Pay Item Pay Unit**

LED In-Pavement Marking Each

Master Controller Each

Payment will be full compensation for all materials and work necessary to complete the items, including testing, saw cutting, installation, earthwork, sealing, patching, warranty, on-site representative, training, and manuals.

Adhesive materials will not be measured and paid for separately but shall be included in the work.

Wiring between pavement markings, MCs, and power sources will be measured and paid for in accordance with Section 613, Pay Item 613, Wiring, Lump Sum.