Special Specification 6363
LED Roadway Illumination Assembly

1. DESCRIPTION

Furnish, fabricate, and install roadway illumination assemblies with light-emitting diode (LED) lamp modules. An LED roadway illumination assembly is the complete assembly of the light fixture, LED light source, lens, pole, power supplies, components and mounting and other hardware constituting a complete and structurally sound lighting unit.

2. MATERIALS

Use new materials conforming to the details shown in the plans and the pertinent requirements of the following Standard Specification Items:
- Item 416, "Drilled Shaft Foundations,"
- Item 421, "Hydraulic Cement Concrete,"
- Item 441, "Steel Structures,"
- Item 442, "Metal for Structures,"
- Item 445, "Galvanizing,"
- Item 449, "Anchor Bolts,"
- Item 616, "Performance Testing of Lighting Systems,"
- Item 618, "Conduit,"
- Item 620, "Electrical Conductors."

2.1. Submittals. Furnish 2 sets of submittals of the illumination assemblies with luminaires, poles, bases, and all mounting hardware to the Engineer at the project address. Do not purchase materials or begin work before these submittals are approved.

2.2. Poles. Fabrication plants that produce roadway illumination poles, including luminaire arms, must be approved in accordance with DMS-7380, "Steel Non-Bridge Member Fabrication Plant Qualification." This includes fabricators of aluminum roadway illumination poles and luminaire arms. The Materials and Tests Division maintains a list of approved fabrication plants of roadway illumination poles.

Do not provide shop drawings for complete assemblies that are fabricated in accordance with this Specification and the details shown on the plans. Electronically submit shop drawings in accordance with Item 441, "Steel Structures," for optional multi-sided steel pole designs; optional aluminum pole designs; and non-standard designs, required when basic wind speeds or pole base mounting heights at the installation locations are in excess of those shown on the Roadway Illumination Pole (RIP) standard. Manufacturers may request that the Department add their submitted shop drawings and design calculations to a pre-approved list of optional and non-standard pole designs, maintained by the Traffic Safety Division.

Hot-dip galvanize fabricated pole sections and associated parts in accordance with Item 445, "Galvanizing." Punch or drill holes in steel parts or members, when allowed, before galvanizing.

When shown on the plans, paint poles in accordance with the plans for uncoated structures and in accordance with Item 445, "Galvanizing" for galvanized structures.

2.3. LED Luminaires:
2.3.1. **General Requirements.** Provide an LED style luminaire with the mounting type, pole, base, mast arm length, and mounting height as detailed in the plans.

2.3.2. **Type II.**

2.3.2.1. **Option 1:** Philips Gardco Pureform 26” (P26-64l-800-NW-G2-SF-2-240); or

2.3.2.2. **Option 2:** Approved equivalent according to the following specifications:

- Lamp Spec: Equipped with an LED driver that accepts 120V through 277V, or 347V through 480V, 50hz to 60hz, input. Driver output is based on the LED wattage selected. Component-to-component wiring within the luminaire will carry no more than 80% of rated current and is listed by UL for use at 600 VAC at 302°F / 150°C or higher. Plug disconnects are listed by UL for use at 600 VAC, 15A or higher. Power factor is not less than 90%. Luminaire consumes 0.0 watts in the off state. All motion sensors utilized consume 0.0 watts in the off state. Surge protector standard. 10KA per ANSI/IEEE C62.41.2.
- LED Thermal Management: Die cast aluminum integral thermal radiation fins
- Distribution: Type II
- Lumens: 21078
- Watts: 153
- Driver: 800mA
- # of LEDs: 64
- CRI: 70
- BUG rating: B3-U0-G3
- Color Temp.: 4000K
- Efficacy: 138
- Housing: Shall be constructed of low copper die cast aluminum alloy, fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) textured polyester powder coat finish, low profile (<5”)
- Electrical: 240V
- Effective Projected Area: 0.38 ft²

2.4. **Performance Requirements.** Photometric data must be certified by manufacturer’s laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. Provide photometric data (in .ies format) for luminaires at specified color temperature and operating at 25°C ambient temperature. Ensure the fixture will be IESNA cutoff or better.

2.5. **Warranty.** The manufacturer will replace failed luminaires, when non-operable due to defect in material or workmanship, within five years of installation with a luminaire that meets all specifications, delivered to the project location. Photocells (if used) are subject to the warranties of their respective manufacturers.

3. **CONSTRUCTION**

Perform work in accordance with the details shown on the plans in accordance with the manufacturers' requirements and the requirements of this Item. Permanently mark roadway illumination pole base plates, at a visible location when erected, with the fabrication plant’s insignia or trademark.

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

Prevent scarring or marring of poles, luminaire arms, and luminaires. 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 441, “Steel Structures” or Item 445, “Galvanizing.”
Stake, install and align each illumination assembly as shown on the plans. The Department may shift a luminaire’s location, if necessary, to secure a more desirable location or to avoid conflict with utilities.

Construct foundations for roadway illumination assemblies in accordance with Item 416, “Drilled Shaft Foundations,” and the details shown on the plans.

Furnish and install illumination assembly components in accordance with the details, dimensions, and requirements shown on the plans. Do not use screw-in type foundations. Install anchor bolts and coat anchor bolt threads in accordance with Item 449, “Anchor Bolts.” Erect structures after foundation concrete has attained its design strength as required on the plans and Item 421, “Hydraulic Cement Concrete.” Tighten anchor bolts for poles with shoe bases in accordance with Item 449, “Anchor Bolts.” Do not place grout between base plate and foundation. Test installed roadway illumination assemblies in accordance with Item 616, “Performance Testing of Lighting Systems.”

4. MEASUREMENT

This Item will be measured as each LED Roadway Illumination Assembly 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 price bid for “Install LED Roadway Illumination Assemblies” of the type specified.

This price is full compensation for furnishing, installing, and testing LED luminaires; furnishing and installing lamps, luminaire arms, brackets, poles, anchor bolt assemblies, templates, internal conductors, and connections; conducting system performance testing; and materials, equipment, labor, tools, and incidentals.

New drilled shaft foundations will be paid for under Item 416, “Drilled Shaft Foundations.” New concrete riprap placed around foundations will be paid for under Item 432, “Riprap.” 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 duct cable will be paid for under Item 622, “Duct Cable.” New ground boxes will be paid for under Item 624, “Ground Boxes.” New electrical services will be paid for under Item 628, “Electrical Services.”