Special Specification 6333
LED Decorative Illumination Assembly

1. DESCRIPTION

Furnish, fabricate, and install decorative illumination assemblies with light-emitting diode (LED) luminaire modules, and pole mounted GFCI receptacles in accordance with the details shown on the plans.

2. MATERIALS

Furnish new materials conforming to the details shown in the plans and the pertinent requirements of the following Standard Specification items:

- Item 442, “Metal for Structures”
- Item 449, “Anchor Bolts”
- Item 616, “Performance Testing of Lighting Systems”
- Item 421, “Electrical Conductors”

2.1. Submittals. Furnish 7 sets of submittals of the illumination assemblies with GFCI outlets, luminaires, files for luminaires, poles, bases, all mounting hardware and color sample to the Engineer at the project address. Do not purchase materials or begin work before these submittals are approved.

2.2. Pole Options. Furnish a one-piece straight steel shaft with round cross section. The nominal pole height will be 14 ft. Pole section must have a minimum diameter of 4 in nominal. The yield strength must be minimum of 46,000 psi (ASTM-A500, Grade C). Longitudinal weld seam to appear flush in shaft wall. Steel base plate with axial bolt circle slots welded flush to pole shaft having a minimum yield strength of 36,000 psi (ASTM A36). Provide rectangular 3x5 steel hand hole frame with mounting provisions for grounding lug located behind gasketed cover. Provide a removable two-piece square aluminum base cover.

Provide a 20A, 120V GFCI weather-resistant receptacle with a weatherproof cover to be located with a minimum vertical clearance of 10 ft. from walking surface and below the support arm luminaire assembly and to be in line with the hand hole in the pole. Pole assembly must meet the aesthetics and design criteria shown in the plans and should closely match the existing poles in the vicinity. Exposed hardware must be stainless steel. All electrical components must be UL listed.

Pole assembly finish must be thermoset polyester powder coat finish with nominal 3.0 mil thickness. Powder paint prime applied over “white metal” steel substrate cleaned via mechanical shot blast method. Decorative finish coat will be Bronze color in accordance with the details shown on the plans.

Fabricate hardware, brackets, nuts, bolts, washers, ballast tray, and parts from corrosion resistant material of adequate thickness as approved. Ensure compatibility of metals used in contact with one another will not induce accelerated galvanic corrosion. Pole shaft must support the luminaires, and all equipment as detailed for typical wind load expected at location of installation. Provide grounding provision with hardware.

2.3. LED Luminaire:

2.3.1. General Requirements. Provide a decorative LED luminaire with a minimum of 4,800 lumens, 4000K and “dark sky” compliant shielding. All luminaires to be installed on strut arm assemblies as detailed in the plans.

2.3.2. Electronic Driver and LED Luminaire Modules. Provide replaceable LED driver modules that will operate at 120V to 240V line voltage; auto ranging. Provide a two-position barrier-type terminal block secured to housing. Provide lugs with captive screws for wire sizes up to 10 AWG. Identify each terminal position.
Provide LED luminaire modules so that catastrophic loss or failure of an individual LED will not result in the loss of the entire luminaire. Provide luminaire modules with a color temperature of 4000K. Color temperature should closely match the existing luminaires in the vicinity. Provide sufficient thermal management of the heat generated by the luminaire to ensure a minimum operable life of 90,000 hr. with an average operating time of 12 hr. per night. Provide a passive thermal management system if required. Fans or other mechanical cooling systems will not be allowed. Design luminaire so that the maximum junction temperature of the LEDs at maximum ambient temperature will not be exceeded, and will not exceed 105°C.

2.3.3. **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.

2.3.4. **Warranty.** The manufacturer will replace failed luminaires, when non-operable due to defect in material or workmanship, within ten 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.

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 painted areas of roadway illumination assemblies according to manufacturer's recommendation.

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.

Fabricate 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. Erect structures after foundation concrete has attained its design strength as required. Tighten anchor bolts for poles with shoe bases. Do not place grout between base plate and foundation. Test installed illumination assemblies.

4. **MEASUREMENT**

This Item will be measured as each LED Decorative 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 “IN RD IL AM (55W LED ARRAY)(ORNAMENTAL)”.

This price is full compensation for furnishing, installing, and testing LED luminaires; drivers, anchor bolts, anchor plates, internal transformer, internal conductors, lightning arrestors, GFCI receptacles, poles, decorative bases, arms, banner brackets, and connections; system performance testing; and equipment, labor, tools, and incidentals.

New precast shaft foundations will be paid for under Special Specification 4128 “Precast Light Pole Foundations” 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 ground boxes will be paid for under Item 624, “Ground Boxes.” New electrical services will be paid for under Item 628, “Electrical Services.”