MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**LUMINAIRE,** **LIGHT EMITTING DIODES, TYPE D-1, D-2**

DET:SLN 1 of 2 APPR:BMB:NJM:07-01-22

**a. Description.** This work consists of furnishing and installing new luminaires at the locations shown on the plans.

**b. Materials.** Furnish materials in accordance with the following requirements:

1. Luminaires Located Adjacent to Pedestrian And Bicycle Paths. Mount to luminaire pole Type D-1. Utilize LED operating at 277 volts as depicted on plans, not to exceed 150 watts of power. Color temperature of 4300 kelvin (K) (±500K) and designed to operate at temperature range of -40 °Celsius to +40 °Celsius.

2. Ensure luminaire is diecast aluminum, with silver painted finish, color to match *Reichs-Ausschuß für Lieferbedingungen und Gütesicherung* (RAL) #9006. Furnish fused and *UL* listed for wet locations. Furnish integral, weathertight LED driver compartment with aluminum heat sinks. Active cooling systems, such as fans, etc., are prohibited. LED chips integrated into fixture: high-power variety manufactured by Philips (Lumileds), Osram, General Electric, Nichia, Cree, or Engineer approved equal.

3. Photometric data in accordance with *Illuminating Engineering Society of North America (IESNA) LM-79, 80* and formatted in accordance with *IESNA-LM-63-02*. Ensure photometrics are tested and verified by third-party independent lab. Ensure the photometric test lab is recognized by the Department of Energy (DOE) as qualified to conduct photometric test in accordance with *IESNA LM-79-08*.

4. Utilize nano-optics to control photometric distribution. Manufacturer must have the ability to apply backlight control at each LED package, without using shields applied to luminaire housing.

5. Lighting Criteria.

A. The following lighting design criteria must apply to all lighting applications:

(1) Luminaire Offset. Type D-1 Luminaire centerline must be at least 3 feet from back of curb.

(2) Uniformity. Uniformity (average/min footcandles) must not exceed 4:1 on conservancy pathway surfaces.

(3) Average Footcandles. Average footcandle level measured on pathway surface must be at least 1.0 footcandle.

B. Type D-1 Luminaire, Pathway. The following lighting design criteria must apply to this application:

(1) Spacing. Nominally at 80 feet on center, with a minimum of 65 feet and a maximum of 100 feet.

(2) Mounting Height. Between 16 and 18 feet above adjacent pathway surface.

(3) Pathway Width. Illuminated pathway or area must not exceed 36 feet in width.

6. Basis of Design. CREE EDGE Series.

A. Luminaire, Type D-1. Cree Cat No. ARE-EDR-2MP-R3-04-E-UL-SV-525-P-40K, 46 watt LED lamp, with UL rating, Ingress Protection 66 rated, wet listed suitable for City of Detroit.

B. Luminaire, Type D-2. Cree Cat No. PWY-EDG-3M-P4-02-E-UL-SV-525-40K, 22 watt LED lamp, with UL rating, Ingress Protection 66 rated, wet listed suitable for City of Detroit.

7. Acceptable Products:

A. CREE EDGE Series

B. Philips Lumec UrbanScape Series

C. Or pre-approved equal.

8. Shop Drawings. Furnish shop drawings in PDF that clearly illustrate the dimensions and appearance of the Luminaire for approval by the Engineer a minimum of 14 calendar days prior to ordering any materials. Do not order any materials until approval of shop drawings is received from the Engineer.

**c. Construction.** Mechanically fasten luminaire to pole tenon by means of recessed set screws. Use a quick-disconnect connector for electrical connection to main power, including ground.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price, for both Type D-1 and D-2 luminaires, using the following pay item:

**Pay Item Pay Unit**

Luminaire, LED, Type \_\_ Each