



**SPECIAL PROVISIONS
FOR
LIGHTING**

**Scott County
IM-NHS-074-1(198)5--03-82**

**Effective Date
April 25, 2017**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150213.01 DESCRIPTION.

Furnish all work, apparatus, and materials according to the applicable portions of Section 2523 of the Standard Specifications, unless as modified herein.

A. Definitions.

- Pole Supply Contractor: Supplier of the roadway and pedestrian lighting poles.
- Luminaire Supply Contractor: Supplier of roadway and pedestrian LED luminaires.
- Aesthetic Luminaire Supply Contractor: Supplier of aesthetic LED luminaires and aesthetic lighting data hub, except for the overlook bench luminaire (LG) which shall be supplied as part of this Contract.

B. Work Under Separate Contract.

- Poles will be furnished and delivered by others.
- Luminaires will be furnished and delivered by others.
- Aesthetic Luminaires, except for the overlook bench luminaire (LG), and aesthetic lighting data hubs will be furnished and delivered by others.

150213.03 MATERIALS.

Provide lighting materials that meet the requirements of Division 41, except as modified here.

A. Overlook Bench Luminaire (LG).

The luminaire shall be: Flexible, linear LED 4000°K Correlated Color Temperature (CCT).

1. Information Required. The supplier shall submit the following information relative to the luminaire he proposes to furnish:
 - Outline drawing.

- Complete description and weight.
 - Candlepower distribution curve.
 - Luminaire efficacy.
 - Center beam candle power.
 - Manufacturer's name and catalogue designation of the luminaire.
 - IES formatted photometric curve in electronic format.
2. Sample. One completely assembled luminaire with cord and plug of the manufacturer intended to be furnished, shall be submitted upon request of the Engineer within 15 business days of such request.
 3. Assembly. Each luminaire shall be delivered completely assembled, wired, and ready for installation. It shall consist of: flexible polymer light engine, rigid, formable, optically diffuse UV resistant Lexan light guide, Lexan weather box, bend aid Lexan light guide mounting clips Lexan end caps Lexan light guide connectors and all necessary hardware. IP66 rated.
 4. Finish. The luminaire shall be comprised of non-corrosive materials. The luminaire finish shall have passed salt spray testing to ASTM B117 standards. Surface texture and paint quality shall be subject to inspection and approval by the Engineer. Light guide shall be diffused white. Samples shall be submitted for approval by the Engineer.
 5. Connections. Power cable and fixture feed thru connections shall be made inside weather box per manufacturers installation instructions.
 6. Control. Fixture shall be controlled via timeclock.
 7. Power Supply. The power supply must be designed to furnish proper electrical characteristics for starting and operating a 23 watt, white LED array between a minimum ambient temperature of -40°C and a maximum ambient temperature of 60°C. The power supply will be capable of accepting input voltage between 90 and 264 VAC and providing a maximum of 80W at 25.6 VDC. The power supply must be UL certified.
 8. Photometric Requirements. The manufacturer shall demonstrate that the luminaire meets or exceeds the specified photometric requirements. The manufacturer shall provide published photometric luminaire data as part of the submitted package. The proposal shall contain luminaire photometric performance with results equal to or better than those listed as minimum requirements identified below in this Special Provision. Submittal information shall include a summary demonstrating achievement of all listed performance requirements.

Minimum Performance Requirements:

Minimum Delivered Lumens at Full Output	85lms/ft
Minimum Efficacy	29lms/W
Beam Spread	114 degrees (H) by 180 degrees (V)

9. Testing. All testing shall be done on a prototype of the actual luminaire to be provided under this Special Provision by an independent testing company. If recent test results are available, they may be considered as meeting the testing requirements of this Special Provision. The Engineer will have the final approval of which tests are adequate. The manufacturer shall be responsible for all costs associated with the specified testing, incidental to this contract.
 - a. Photometric testing shall be in accordance with published IESNA lighting measurement testing and calculation guidelines. The tests, at a minimum, shall yield:
 - A polar candela distribution table.
 - A flood summary table.
 - An LM-79 report
 - An LM-80 report

- b. Electrical testing shall conform to applicable NEMA and ANSI standards and at a minimum shall yield:
 - Regulation data.
 - Power factor.
 - A table of power supply characteristics.
- c. Initial testing (start of life testing).
 - Any automatic thermal management features.
 - Power supply losses (system efficiency)
 - Current waveform shape and inrush current.
 - Record voltage waveform.
 - Photometry data for the test fixture shall be recorded and compared to data for the same fixture provided by the manufacturer.
 - Results for voltage and current waveforms for ignition voltage, crest factors, power factor.

- 10. Fixture must be RoHS compliant and have passed RoHS testing.
- 11. Thermal testing in accordance with UL. At no time shall any of the components exceed the manufacturer's recommended operating temperatures.
- 12. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the test, all set screws, castings and components shall be secure and undamaged. The luminaire will not be energized for this test.
- 13. Warranty. The manufacturer shall warrant the performance and construction of these luminaires to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of 5 years after the date of manufacture as indicated on the luminaire. This will be interpreted particularly to mean compatible performance of power supply, failure of any component, discolorations or fogging of lenses impairing the transmission of light. Any luminaire or part thereof, not performing as required or developing defects within this period shall be replaced by the manufacturer without expense to the State.
- 14. **White LED Array (LG).**
 - a. Light Output. White light with a 4000°K Correlated Color Temperature (CCT). At 50,000 hours the mean output lumens shall not be less than 70% of the initial lumen output.
 - b. Testing. All LEDs shall be tested according to the applicable requirements in LM80 and shall operate between a minimum ambient temperature of -40°C and a maximum ambient temperature of 55°C.
 - c. LED Array Characteristics. LED array shall meet the following:

Maximum Wattage	Rated Life (hours)	Initial Lumens
2.88 / ft	50,000	85 / ft

B. Delivery.

- 1. **Light Poles.**
 - a. **Delivery, Storage, and Handling.**
The Contractor shall supply the Engineer with a required delivery schedule for the lighting poles within 6 weeks of contract award. The Contractor shall supply the delivery schedule to the pole supply contractor upon approval. It shall be the responsibility of the Contractor to coordinate delivery with the pole supply contractor.

- 1) Delivery should be coordinated as to minimize handling and on-site storage requirements. If required, storage at the project site shall be provided by the Contractor at no additional cost to the contract.
- 2) A minimum of ten light poles per delivery is required.
- 3) The light poles shall be stored in such a manner as to prevent staining, discoloration, or other damage.

b. Inspection and Acceptance.

The Contractor shall examine and document the condition of the lighting poles, in the presence of the Engineer, before accepting delivery. The Contractor shall be held responsible for the condition of the light pole as well as any repairs or replacements required due to any change in condition caused by site handling, storage, and installation. All repairs are subject to approval by the Engineer. The Contractor shall:

- 1) Remove and replace damaged light poles if repairs do not comply with requirements.
- 2) Clean exposed surfaces of the light poles after installation to remove dirt, stains, and other markings.
- 3) Do not use cleaning materials or processes that could change the appearance of exposed finishes.

2. Luminaires and Data Hub.

a. Delivery, Storage, and Handling.

The Contractor shall supply the Engineer with a required delivery schedule for the roadway luminaires, aesthetic luminaires, and aesthetic lighting data hub within 6 weeks of contract award. The Contractor shall supply the delivery schedule to the luminaire supply contractor and the aesthetic luminaire supply contractor upon approval. It shall be the responsibility of the Contractor to coordinate delivery with the supply contractors.

- 1) Delivery should be coordinated as to minimize handling and on-site storage requirements. If required, storage at the project site shall be provided by the Contractor at no additional cost to the contract.
- 2) A minimum of 20 luminaires per delivery is required.
- 3) The luminaires shall be stored in such a manner as to prevent damage.
- 4) Obtain and follow the Manufacturer's recommendations for the handling and installation of the luminaires.

b. Inspection and Acceptance.

The Contractor shall examine and document the condition of the luminaires and data hubs, in the presence of the Engineer, before accepting delivery. The Contractor shall be held responsible for fully functional luminaires and data hubs as well as any repairs or replacements required due to any change in condition caused by site handling, storage, and installation. All repairs are subject to approval by the Engineer. The Contractor shall:

- 1) Remove and replace damaged luminaires if repairs do not comply with requirements.
- 2) Clean exposed surfaces of the luminaires after installation to remove dirt, stains, and other markings.
- 3) Do not use cleaning materials or processes that could change the appearance of exposed finishes.

150213.03 CONSTRUCTION.

A. Light Poles.

1. Each light pole shall be assembled and installed upon its foundation in accordance with the manufacturer's recommendations. Prior to installation, the pole and all its components shall be inspected by the contractor, in the presence of the Engineer. Any parts found to be defective shall be repaired or replaced.
2. The pole shall be set plumb on the foundation and fastened to the anchor bolts with self-locking nuts or double nuts (two per anchor bolt) and washers. Flat washers shall be installed below and above the isolation washer. A 1/2 inch minimum isolation pad and a 1/2 inch minimum

leveling pad shall be installed between the light pole base plate and the bottom nut (leveling nut) with a steel washer between the leveling nut and the leveling plate. The nuts shall be tightened in compliance with torque specifications recommended by the manufacturer of the isolation pad. See plans for attachment detail.

3. The space between the finished top of the foundation and the bottom of the base plate of the pole shall be enclosed with an expanded metal screen made of stainless steel. The mesh of the screen shall be 0.250 inch or less as approved by the Engineer. The screen shall be held in place with bands made of stainless steel. At least two bands shall be installed around the pole base plate. The bands shall be held tight by a ratchet-type device. Grouting shall not be used to enclose the above described space.
4. **Anchor Bolts.**
 - The anchor bolts for Type II poles shall be included with concrete barrier railing.
 - The anchor bolts for Type III poles shall be included with concrete parapet, fence.

B. Luminaires.

1. Installation shall be in accordance with the applicable portions of Section 2523.03 of the Standard Specifications.
2. Install all components and accessories furnished with each luminaire including all electrical components, and wiring.
3. Each luminaire shall be mounted as indicated and as required for permanent lighting installation.
4. Unless otherwise indicated, each luminaire shall be set in a plane parallel to the roadway.
5. The installation shall be complete with fusing and connection to the applicable lighting feeder circuits.

C. Aesthetic Lighting Data Hub.

Installation shall be in accordance with the applicable portions of Section 2523.03 of the Standard Specifications and as detailed in the plans.

D. Overlook bench Lighting.

1. Installation shall be in accordance with the applicable portions of Section 2523.03 of the Standard Specifications and as detailed in the plans.
2. Install all components and accessories furnished with each luminaire including all electrical components, and wiring.

150213.04 METHOD OF MEASUREMENT.

A. Light Poles.

The Light Pole will be measured by the unit each, complete for each of the items listed below. All related apparatus shall be included.

- Lighting Pole, Install Only
- Pedestrian Pole, Install Only

B. Luminaires.

The Luminaires will be measured by the unit each, complete for each of the items listed below. All related apparatus shall be included.

- Pedestrian Luminaire, Install Only

- Roadway Luminaire, Install Only
- Aesthetic Light, Install Only (Type "LA")
- Aesthetic Light, Install Only (Type "LA-1")
- Aesthetic Light, Install Only (Type "LA-2")
- Aesthetic Light, Install Only (Type "LB")

C. Aesthetic Lighting Data Hub.

The aesthetic lighting data hub will be measured by the unit each, complete. All related apparatus shall be included.

D. Overlook Bench Lighting.

The overlook bench lighting will not be measured separately.

150213.05 BASIS OF PAYMENT.

A. Light Poles.

This work shall be paid for at the contract unit price each for the items listed below, of the type, mounting height and luminaire mounting positions indicated, which shall be payment in full for installing the light pole complete as described in these specifications.

- Lighting Pole, Install Only
- Pedestrian Pole, Install Only

B. Luminaires.

This work will be paid for at the contract unit price per each for the items listed below, of the type specified in the plans, which price shall include all material, hardware, storage, and labor required for complete installation of the Luminaires, as shown on the contract plans and as specified herein.

- Pedestrian Luminaire, Install Only
- Roadway Luminaire, Install Only
- Aesthetic Light, Install Only (Type "LA")
- Aesthetic Light, Install Only (Type "LA-1")
- Aesthetic Light, Install Only (Type "LA-2")
- Aesthetic Light, Install Only (Type "LB")

C. Aesthetic Lighting Data Hub.

This work will be paid for at the contract unit price per each for Aesthetic Lighting Data Hub, Install Only, which price shall include all material, hardware, storage, and labor required for complete installation of the data hub, as shown on the contract plans and as specified herein.

D. Overlook Bench Lighting.

This work shall be included in the cost of Overlook Benches.