



**SPECIAL PROVISIONS
FOR
STREET/AREA LIGHTING**

**Des Moines County
EDP-0977(650)--7Y-29**

**Effective Date
October 20, 2020**

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.

155053.01 DESCRIPTION.

A. Scope.

This Specification governs the furnishing of all material, equipment, and labor for the installation and testing of a complete, operational LED lighting system, including power and data to miscellaneous equipment noted. All material and equipment supplied, and all work performed, shall be in accordance with these Specifications, and as shown on the plans.

B. Definitions.

1. Luminaire: Complete lighting unit consisting of housing, optical chamber, lens, lamps, driver, mounting hardware and all parts as required to direct and distribute light.
2. Color System Controller: Electronic unit with hardware, software and memory to store shows and transmit data signal to play the light show.
3. Data Drivers: Electronic unit that combines power and data signal into a single cable.
4. Color Luminaire Cables: Cables with connectors which join luminaires together into a system.

C. Operating Instructions.

1. Fully and carefully instruct the City representatives, regarding the proper operation, care and maintenance of each system and its equipment.
2. Furnish all keys and special wrenches furnished with equipment under his contract to the City at the completion of the project.

D. Coordination of Work.

The electrical contractor shall plan all work so that it proceeds with minimum interference with other trades. The electrical contractor shall cooperate with all other contractors in furnishing material and information, in proper sequence, for the correct location of all sleeves, inserts, foundations, wiring, etc. The electrical contractor shall pay for all extra cutting and patching made necessary by his failure to properly direct such work at the correct time.

E. Submittals.

1. Product Data.

For each luminaire, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and LED Fixtures including drivers and all electrical and mechanical parts required for a fully installed and functioning LED Light Fixture.

2. Shop Drawings.

Include complete scaled, technical drawings showing all existing and proposed lights, materials, support poles, bases, audio speakers, wifi router, fasteners, wiring, connections, and other parts as indicated in the contract documents.

- a. LED Fixtures
- b. Color System Controller
- c. Power Supplies
- d. Data Drivers
- e. Manufacturer supplied cables
- f. Lighting Photometric Calculations shall be submitted to show the lighting system performance. The Contractor shall submit point by point computer calculations confirming the minimum proposed footcandles. The calculations shall be done with a 0.85 light loss factor.

155053.02 MATERIALS.

A. General.

1. The Contractor shall be solely responsible to verify quantities, installation locations and wiring requirements for this work. It is the responsibility of the contractor to verify all control and interface devices with the manufacturer to provide a complete functioning system.
2. Unless otherwise specified, all materials and equipment shall be new, unused and undamaged. Materials and equipment shall be the current and standard designs of manufacturers regularly engaged in their production.
3. Where materials and equipment are indicated as furnished by others and installed or connected under this contract, it shall be the Contractor's responsibility to verify installation details.

B. Wires and Cables.

1. Network Communication Cable.

- a. Non-plenum rated, 4-pair unshielded cable, No. 24 AWG, solid bare copper, polyolefin insulated, adjoined singles, ripcord, flexible PVC jacket. Jacket is sequentially marked at two foot intervals.
- b. Supports Category 6 applications, such as 100 Base TX, 100 Base VF. Ideal for high bandwidth applications.
- c. UL tested for use with high speed audio-video systems in accordance with FCC Class A digital devices at a fundamental frequency of 135 MHz.

- d. Suitable for noisy environments such as running next to power cables and transformers.
 - e. Cable shall contain the following physical characteristics:
 - f. Belden DataTwist 4800 or equal.
- 2. Fiber Optic Cable.**
- a. Multi-strand cable with FRP outer jacket; containing 6-strand 62.5/125 um core/cladding multi-mode.
 - b. Cable material shall be all di-electric.
 - c. Cable shall be filled with water blocking material.
 - d. Outer sheath shall be marked with manufacturer name identifying cable type, year of manufacturer, and sequential length markings.
 - e. Cable shall carry an OFNR rating (Optical Fiber Non-Conductive Riser) and shall be listed as being suitable for use in a 'vertical run in a shaft or from floor to floor and shall be listed as having fire-resistant characteristics capable of preventing the carrying of fire from floor to floor.
 - f. Corning DX006, or equal.
- C. Wi-Fi Router.**
- 1. Street lighting pole(s) shall be furnished with Wi-Fi router where shown in the plans. Router shall be contained within the pole and shall accept a fiber optic network connection.
 - 2. Router shall accept 120V power connection, 23W maximum.
 - 3. One 10/100/100BASE-T Ethernet network interface.
 - a. Auto-sensing link speed and MDI/MDX.
 - b. 802.3az Energy Efficient Ethernet.
 - 4. Visual indication of radio status. Contains reset button and Micro USB console interface.
 - 5. Bluetooth low energy radio.
 - 6. Wi-Fi radio
 - a. Software-configurable dual radio supports 5 GHz and 2.4 GHz.
 - b. Supports up to 256 associated client devices per radio, and up to 16 BSSIDs per radio.
 - 7. Aruba 318 Series.
- D. Light Pole Speaker System.**
- 1. Street lighting poles shall be furnished with integral speaker system, as shown in the plans. Speakers shall be contained within the pole and accept an ethernet network connection.
 - 2. Speaker shall operate on POE (Power Over Ethernet) configuration with ethernet network cable daisy-chained between poles.
 - 3. Frequency Response: 100 Hz – 20 kHz.
 - 4. Signal to Noise Ratio: >88dB noise floor of -95 dBV.
 - 5. Revolution Acoustics, POE++LZ220.

155053.03 CONSTRUCTION.

A. General.

This section governs the construction of all foundations and the installation of all luminaires,

poles, conduits, cables and other material and equipment as required to complete the street lighting system as shown on the plans, the standard drawings, and as specified in the Special Provisions. The Contractor is responsible for verifying the correct line and grade of all concrete foundations and conduits prior to installation.

B. Led Luminaire Installation.

The Contractor shall comply with the manufacturer's recommendations for installation procedures.

C. Grounding.

The Contractor shall comply with the NEC and the manufacturer's recommendations for grounding the lighting system.

D. Training.

After the Street LED Lighting System is functioning properly, the Contractor shall schedule a training session for City personnel. The training session shall be taught by a factory-trained applications engineer to explain the software program and to aid the City in programming various speaker and router functions. The training shall be planned to include a full day, as desired by the City.

E. Warranty.

The manufacturer shall warrant the performance and construction of the 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 drivers with LED arrays, failure of any component, failure of any of the LED's, and discolorations or fogging of the lens, 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 City.

155053.04 METHOD OF MEASUREMENT.

Method of measurement shall be each for Lighting Poles with Integrated Speaker and Lighting Poles with WI-FI Router

155053.05 BASIS OF PAYMENT.

Payment for Lighting Poles, of the type specified, will be at the contract unit price per lump sum. Payment shall be full compensation for all items required for the system including the aesthetic lighting units, equipment cabinets, cables, connectors, installation and all associated hardware and incidentals, labor, equipment and materials for installation.