



**SPECIAL PROVISIONS  
FOR  
LINEAR LED LIGHTING**

**Pottawattamie County  
IMN-080-1(443)2--0E-78**

**Effective Date  
April 15, 2014**

**THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

**120168.01 DESCRIPTION.**

**A. Section Includes.**

1. Exterior luminaires with lamps and ballasts.
2. Luminaire-mounted photoelectric relays.
3. LED accessories.
4. Wire and cable and associated splices, connectors, and terminations for wiring systems rated 600 V and less, and raceways and boxes.

**B. Definitions.**

Fixture: Complete lighting unit, consisting of lamps, wiring, driver, housing, mounting channels, clips, and hardware, lenses and all other parts as required to direct or distribute light.

**C. Codes and Standards.**

1. The electrical work shall be performed by competent craftsmen skilled in the trade involved and shall be done in a manner consistent with normal industry standards. All work shall conform to the currently adopted edition of the National Electric Code (NEC) and all other applicable state and local codes or standards.
2. Where there is a conflict between the code and the contract documents, the code shall have precedence only when it is more stringent than the contract documents. Items that are allowed by the code but are less stringent than those specified shall not be substituted.

**D. Permits.**

All permits, licenses, inspections and arrangements required for the Contractor at their expense will obtain the work. All utilities will be installed in accordance with the local rules and the Contractor shall pay regulations and all charges.

**E. Materials.**

1. 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.
2. 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.

**F. Operation Instructions.**

1. Fully and carefully instruct the City of Council Bluffs 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 of Council Bluffs at the completion of the project.

**G. Coordination of Work.**

The electrical contractor shall plan all work so that it proceeds with a minimum of 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.

**H. Submittals.**

**1. Product Data.**

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

**2. Shop Drawings.**

Include complete scaled, technical drawings showing all existing and proposed lights, materials, fasteners, wiring, connections, and other parts as indicated in the contract documents.

- a. Linear White LED Fixture, complete including proposed installation on existing bridge, indicating lengths and placement of each fixture as well as conduit and power supply to each. Also indicate proposed mounting channels, clips, and fasteners as needed to provide a fully functional lighting system in compliance with the contract documents.
- b. Lighting Drivers and Racks in existing Junction Boxes. Show layout of drivers, racks, and wiring. Indicate all sizes, materials, and fasteners.

**3. Mock Ups.**

Provide one 8 foot long section of Linear LED lighting, install on the bridge, and provide power for a nighttime mock up review by the City of Council Bluffs. If the mock up is not approved, make corrections as directed and prepare additional mock ups until a mock up is approved.

**4. Samples.**

Provide one 8 foot long linear white LED fixture sample complete with aluminum channel, wiring and driver, mounting clips, and hardware. If the sample is approved, install as part of the project work.

**5. Safety.**

Provide a work place safety control plan in compliance with all applicable FHWA, OSHA, and Iowa DOT requirements prior to beginning work.

**I. Delivery, Storage, and Handling.**

1. Deliver light fixtures, drivers, wiring, and mounting components to the project site in original packaging, wrapped and protected so that no surfaces are scratched or damaged by handling.
2. Retain factory-applied wrappings on all components until ready for installation.
3. Transport and handle the fixtures in such a way that they are not damaged in any way.

**120168.02 MATERIALS.****A. Wires and Cables.**

1. Conductors: Copper; color-coded No. 12 AWG minimum size, except that conductors for pilot and control circuits may be No. 14 AWG.
2. Building Wires: Type THHN/THWN.
3. Connectors and Splices: Wiring connectors of size, ampacity rating, material, and type and class for application and for service indicated.

**B. Light Fixtures.****1. General Requirements.**

- a. All fixtures, wiring, and drivers will be UL listed for wet locations and IP66 or IP67 Rated.
- b. Include a quick disconnect twist lock plug for easy removal of all electrical components.
- c. The fixture will be a solid, fully encapsulated LED linear luminaire that is permanently sealed with a solid translucent, UV resistant, covering to evenly emit light, and to keep water out. The fixture will be guaranteed to withstand water, snow, ice, severe hot and cold environmental temperatures, sun, wind, and vibration without damaging its structural, aesthetic, or functional qualities. The lighting will produce at least 54 lumens per foot and not more than 75 lumens per foot. Translucent or transparent tubes with internal LED light strings will not be acceptable as substitutes. Fixture and driver will include a 3 year replacement warranty. The lighting will be homogeneous and dot free, producing a solid white strip of light with the same apparent lumen output and white color temperature throughout. LEDs will have a minimum L70 of 50,000 hours. Drivers will have a minimum estimated life of 50,000 hours.
- d. Contractor will supply all manufacturer's linear LED lights, wiring, drivers, connectors, custom channels, mounting clips, stainless steel hardware and other materials as required for complete installation of fixtures per contract documents.

**2. Manufacturer.**

Ilight Technologies ([www.ilight-tech.com](http://www.ilight-tech.com)), Plexineon 1X Series, UL listed for wet locations, color temperature 3500K White, with trim and silver housing, custom straight lengths per field measurements, stainless steel channel, and L Tab Specialty Stainless Steel spring clips. Ordering code: T-24-W35-S-CL-SC. Driver will be supplied by ILight, UL Listed for wet

locations, 240 Volt input, 24 Volt output, 100 Watt. See plans for driver quantity. Provide each driver with No. 14 AWG, 2 conductor lead-in wire, max. length 40 feet. Provide No. 12 AWG, 2 conductor lead-in wire if length exceeds 40 feet.

3. Galvanized steel driver rack will be fabricated from square galvanized steel unistrut spacers and galvanized steel expanded metal mesh racks. Racks shall be welded together as one piece. Fabricate to the size and shapes required to allow placement of the lighting drivers and wiring within the existing junction boxes as indicated on the drawings.

### **120168.03 CONSTRUCTION.**

#### **A. Examination.**

1. Verifications of Conditions: Prior to the start of installation, verify field conditions and measure proposed lengths of linear LED. Confirm that field conditions match those shown on the contract documents. Notify Engineer of any discrepancies and provide recommended changes for approval on required shop drawings prior to installation.
2. Surface Drainage: Immediately report existing surface water or drainage problems to the Engineer.

#### **B. Site Preparation.**

1. Prior to beginning work request approval of project schedule and work place safety plan by the Engineer.
2. Remove and dispose all existing linear LED lighting including mounting hardware, adhesives, wiring not proposed for the new installation, drivers and appurtenances. Clean steel arch bridge tubes for mounting the linear LED lights to expose a smooth and consistent painted surface. Fill all fastening holes from existing installation with clear silicone. Paint all scratched or damaged surfaces with matching color urethane paint. Request approval of prepared work area before beginning installation.

#### **C. Wiring Installation.**

1. Install wires and cables according to the NECA's "Standard of Installation."
2. Outdoors Wiring Methods: As follows:
  - a. Underground: Rigid nonmetallic conduit, PVC Schedule 40.
  - b. Exposed: Galvanized rigid steel.
3. Use raceway fittings compatible with raceway and suitable for use and location.
4. Install a separate green ground conductor in each branch circuit conduit.

#### **D. Luminaire Installation.**

1. Comply with all traffic control and work safety requirements as necessary.
2. Fasten luminaire to structural supports indicated in contract documents.
  - a. Use fastening methods and materials selected to resist natural and man made forces including wind and bridge vibration as defined for the application and approved by manufacturer.

- b. Installed lighting will fit tight to the underside of the bridge steel arch tubes to provide a smoothly arching, continuous light pattern when completed with no visible angles or gaps between light sections. Installed fixture will be firmly attached and will not bend or sag.

**E. Electrical Service.**

All electrical service and wiring up to and connecting to the fixture is to comply with the requirements of the contract documents.

**F. Corrosion Prevention.**

1. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
2. Steel Conduits: In concrete foundations, wrap conduit with 0.010 inch thick, pipe-wrapping plastic tape applied with a 50% overlap.

**G. Grounding.**

Install grounding for each fixture per the requirements of the manufacturer and as shown in the contract documents.

**H. Field Quality Control.**

1. Inspect each installed fixture for damage. Replace and/or repair damaged fixtures and components.
2. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source. Verify operation of photoelectric controls.

**120168.04 Method of Measurement.**

Linear LED Lighting will not be measured for payment, but will be paid for at the lump sum contract unit price.

**120168.05 Basis of Payment.**

Work will include removing the existing LED lighting including all drivers, wiring, fasteners, adhesive and other remnants to provide a clean structural surface for the linear LED lighting installation as well as all other site preparation on and off the bridge as required to complete the work as shown in the contract documents. Work will also include providing and installing Linear LED light fixtures including all light fixtures, wiring and connections, drivers and racks, mounting channels, mounting hardware and fasteners, j box modifications, incidental materials and installation as necessary to provide a complete and working linear LED bridge lighting system. Item will also include all excavation, backfill, underground PVC conduit, surface-mounted RGS conduit at LED fixtures, fittings, conductors (both installed in existing and proposed conduit), terminal blocks, fuses, connections and other work necessary to provide fully functioning wiring as shown in contract documents.