SP- 236038
(New)

SPECIAL PROVISIONS
FOR
RECTANGULAR RAPID FLASHING BEACON (RRFB) ASSEMBLY

Scott County
HSIP-SWAP-4252(605)--SJ-82

Effective Date
April 15, 2025

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

236038.01 DESCRIPTION.

A. General.

1. This section covers the furnishing of all labor, materials, tools, equipment and performances of all work and services necessary or incidental for the installation of a fully functional pedestrian-activated rectangular rapid flash beacon (RRFB) system, complete with all post-mounted features/attachments specified in the plans.

2. This work shall consist of furnishing and installing the solar-powered beacon assembly complete with RRFBs, solar panel, battery pack with charger, LED driver, pedestrian button/sign units, crosswalk advance warning signage, and wireless communications equipment, attached to a traffic signal pedestal or other approved mounting system as shown in the plans and as specified by the Engineer.

B. Specification References.

1. All components shall be from the same manufacturer and manufactured system. The manufacturer shall carry service and support for the project location. The furnished system shall utilize a “Top-of-Pole Self-Contained” solar panel and control unit, or with approval from the engineer a pole mounted control box capable of communicating wirelessly across the street to the supplemental RRFB assembly. The RRFB units shall be dual-sided, and pushbutton/sign units shall contain vibrotactile arrows with audible voice messages capable of assisting users with disabilities.

2. In addition to the specifications provided within, the RRFB system shall comply with all applicable sections of the MUTCD, particularly Chapter 4 Sections I, K, and L which directly specify operating parameters for RRFB systems and associated accessible pedestrian

features. Where mentioned within this specification, MUTCD shall mean the current edition of the MUTCD (2023).

3. The system shall generally be powder coated with black finish to match LeClaire's existing downtown electric fixtures. Signs, pushbutton units, and RRFB units shall meet visibility and aesthetic standards of the MUTCD.

C. Submittals.

1. **Material and Equipment List:** Within 30 days after awarding the contract for the project, submit a completed list of materials and equipment. Submit two copies to the Engineer for written approval before any equipment or materials are ordered.

2. **Contractor Certification:** Submit the name and contact information of the licensed electrician and/or certified tech that will be working on the project.

3. **Shop Drawings and Catalog:** Submit three hard copies or one electronic copy of the shop drawings for the system to be furnished. Submit three hard copies or one electronic copy of the catalog cuts and manufacturer's specifications for all items on the equipment list. Provide three hard copies and an electronic copy of all operating and user manuals to the City of LeClaire.

236038.02 MATERIALS.

A. General System Requirements.

1. All materials furnished, assembled, fabricated, or installed shall be corrosion resistant. All mounting hardware shall be Type 304 stainless steel or approved equal.

2. All components shall be manufactured and assembled as a complete system rated for 24 hour/7 days a week/365 days a year operation.

3. The entire system shall have a minimum 3 year warranty.

B. Rectangular Rapid Flashing Beacons.

1. The Contractor shall furnish and install two-directional RRFB units which are pole mounted. The RRFB housing shall be a minimum of 1/8 inch thick aluminum.

2. Each RRFB unit shall satisfy requirements provided within the MUTCD Chapter 4L, including the unit size, mounting location, flash rate, and operational parameters.

C. Solar-Assisted Battery-Powered System.

1. The solar-powered system shall be an easy to install, fully self-contained, weather, corrosion, and vandal-resistant unit with premium grade UV-resistant head. The system shall be power-autonomous without the need for an external power supply. The system shall have an operating temperature range of -35°F to 140°F.

2. The batteries shall be sealed, maintenance free, field-replaceable and rated best-in-class. The battery pack shall have a minimum rated lifespan of 3 years.

3. The system shall have the capacity to operate the beacons continuously for a minimum of 30 days without solar charging and have automatic light control to provide useful light during extreme conditions that prevent charging over an extended period of time.

D. Wireless Communication System.

1. At each crosswalk, the two pole assemblies must communicate wirelessly. The wireless communication shall be able to activate and deactivate each pole RRFB unit simultaneously. The communication equipment shall comply with FCC requirements and the vendor representative shall field test the equipment prior to placing the units in operation to demonstrate the RRFBs ability to achieve property operation under the requirements of FHWA IA-21. The wireless communications of one RRFB system installation shall not interfere with, or cause unintended operation of, RRFBs at nearby intersections.

2. The system shall have push-button activation. Each flashing beacon unit shall have one pedestrian pushbutton meeting ADA requirements.

E. Pole, Base, and Concrete Footing.

1. The flashing beacon assembly shall be installed and mounted as indicated in the plans, using a concrete footing meeting the requirements of Section 2403 of the Standard Specifications.

2. A traffic signal pedestal pole meeting the requirements of the length recommended by the RRFB manufacturer, shall be used to support the flashing beacon assembly hardware. The pole shall be schedule 80 aluminum tubing or the manufacturer's recommendation approved by the engineer, with outer diameter of 4 1/2 inches. Poles shall be powder coated black to match the city's existing light fixtures.

3. The pedestrian pushbuttons shall be installed on pedestrian pushbutton stations including MUTCD compliant button activation sign.

4. Pedestal base shall be cast aluminum or approved equal, square in shape with minimum bolt circle diameter of 6 inches, meeting or exceeding AASHTO breakaway requirements.

5. Anchor bolts shall be four 5/8 inch by 7.5 inch steel (minimum), hot-dip galvanized anchor bolts complying with ASTM F 1554, Grade 36, or meeting manufacturer's recommendations.

F. Pedestrian Pushbuttons.

1. The Accessible Pedestrian Signal (APS) pushbuttons shall be an audible-tactile pedestrian signal system and shall consist of all electronic control equipment, mounting hardware, pushbuttons and signs designed to provide both a pushbutton with a raised, vibrating tactile arrow on the button, as well as a variety of audible indications for differing pedestrian signal functions.

2. The APS pushbuttons shall meet the following requirements:
- **a.** 2023 MUTCD, Chapter 4I and 4K –Pedestrian Control Features and Accessible Pedestrian Signals and Detectors
- **b.** NEMA TS 2-Section 2.1 requirements for Temperature and Humidity, Transient Voltage Protection and Mechanical Shock and Vibration.
- **c.** IEC 61000-4-4; 4-5 Transient Suppression requirements.
- **d.** FCC Tile 47, Part 15, Class A, Electronic Noise requirements.

3. The APS pushbutton enclosure shall meet the NEMA 250 – Type 4X enclosure requirement.

4. Upon installation, the APS shall have the following functional requirements:
- **a.** The APS shall be programmable and adjustable. Programming and adjustments shall be made using a laptop computer or vendor supplied programmer. No additional hardware or equipment shall be required. The APS pushbuttons shall be fully compatible with the

three latest versions of the Windows operating platform. The programmable features shall be:

1) Pushbutton locator tone.
2) Audible pushbutton informational message upon pushbutton activation that says, “yellow lights are flashing”. This message shall be spoken twice.
3) Audible crossing beacon.
4) Vibrating tactile arrow.
5) Independent minimum and maximum volume limits for the Locator Tone, Walk and Audible Beaconing features.

b. All audible features shall emanate from the pedestrian pushbutton housing. The APS shall utilize digital audio technology, having a minimum 12-bit sample at a 16k Hz SP-236017, Page 4 of 7 sample rate. Total harmonic distortion shall be less than 3% at 75 decibels. The APS shall provide independent ambient sound adjustment for the Locator Tone feature. The APS shall allow for Locator Tone volume to be set below the ambient noise level. The system shall have at a minimum, three programmable locator tones. All sound levels shall adjust automatically utilizing an internally mounted, interval ambient sensing microphone in accordance with the MUTCD.

c. The APS system shall log cumulative call data. The data shall be date and time stamped and shall be accessible via laptop.

5. The APS manufacturer must provide the required voice messages in each button as defined below. Additionally, the APS manufacturer must provide the required voice messages to the City of LeClaire.

6. The Contractor shall present the order form below to the APS manufacturer, so the appropriate Braille message is added to the pedestrian information sign and the correct voice messages are programmed in the pedestrian pushbuttons.

G. Signage.

All signs shall meet MUTCD requirement. Signs to be installed as part of the RRFB assembly and required mounting hardware are incidental to this bid item.

H. Footings and Foundations.

1. Use Class C structural concrete complying with Section 2403 of the Standard Specifications.

2. Use uncoated reinforcing steel complying with Section 4151 of the Standard Specifications.

236038.03 CONSTRUCTION.

A. General.

1. The solar powered flashing beacon assembly and system shall be installed in strict accordance with the manufacturer’s recommendations, as shown on the Plans, and as directed by the Engineer, and as modified herein.

2. Mounting of the hardware to the foundation shall follow all manufacturer recommendations and as modified herein. The traffic signal post and pedestal base shall be installed on the foundation in accordance with manufacturer recommendations.

3. The beacons and solar engine shall be attached to the structure using rigid galvanized steel conduit, stainless steel straps, manufacturer recommended mounting brackets, and U-bolts.

4. The beacons and solar engine shall be attached to the structure using rigid galvanized steel conduit, stainless steel straps, manufacturer recommended mounting brackets, and U-bolts.

5. The beacons shall be installed as shown on the Plans. The final elevation and location of the beacons must be approved by the Engineer prior to beginning work.

6. The solar panel shall be installed at the highest point on the assembly structure, or as directed by the Engineer prior to beginning work.

B. Inspection.
The Contractor shall inspect all the electrical equipment and shall notify the Engineer in writing before the equipment is installed if the equipment appears to be deficient in fit, form or function.

C. Coordination.
It shall be the sole responsibility of the Contractor to coordinate among suppliers and contractors providing equipment for the project.

D. Footings and Foundations.

1. **Placement:** Prior to foundation excavation for signal poles, pedestals, and pedestrian pushbutton station posts, the locations shall be verified in the field by the Engineer.

2. **Excavation:** Excavate to the size, shape, and depth specified in the contract documents. Ensure the bottom of all foundations rest securely on firm undisturbed soil. Minimize over-excavation to ensure support and stability of the foundation. Construction of the foundations may require hand excavation to verify location of utilities.

3. **Foundation:** Provide a means for holding all of the following elements rigidly in place while the concrete is being placed:
   a. **Forms.**
      1) Set the forms level or sloped to meet the adjacent paved areas.
      2) Provide preformed expansion material between foundation and adjacent paved areas.
      3) When installed in an unpaved area, set the top of the foundation 4 inches above the surface of the ground.
      4) Remove all forms before backfilling after required cure time
   b. **Reinforcing Steel.**
      Install reinforcing steel.
   c. **Conduit.**
      Install conduit.
   d. **Anchor Bolts.**
      1) Set anchor bolts using a template constructed to accommodate the specified elevation, orientation, and spacing according to the pole and controller manufacturer's requirements.
      2) Center the pole anchor bolts within the concrete foundation.
      3) Protect the anchor bolts until poles are erected.
      4) Orient controller footing with the back of the cabinet toward the intersection such that the signal heads can be viewed while facing the controller, unless otherwise directed by the Engineer.
   e. **Concrete.**
      1) Place concrete to form a monolithic foundation. Consolidate concrete by vibration methods.
      2) Finish the top of the base level and round the top edges with an edging tool having a radius of 1/2 inch. Provide a rubbed surface finish on the exposed surface of the footing or foundation.
      3) Allow the foundation to cure a minimum of 4 days prior to erecting the poles unless strength is otherwise confirmed with tests prior to the 4-day cure period.
   f. **Backfill .**
      Place suitable backfill material according to Section 2552 of the Standard Specifications.

236038.04 METHOD OF MEASUREMENT.

Lump Sum. No field measurement will be made.

236038.05 BASIS OF PAYMENT.

A. This item will be paid at the established contract unit price for Rectangular Rapid Flashing Beacon (RRFB). All labor, materials, and equipment necessary for installation of a fully functional RRFB system specified herein is included in this item.

B. This work includes, but is not limited to the following:

- Programming software kit,
- Wireless communication hardware system,
- RRFB dual-sided units,
- Integrated controller top-mount self-contained solar panel/control unit for each pole,
- Pole mounted APS stations with button unit and MUTCD signs (R10-25),
- 13 foot pole kits with J-Bolts for concrete installation,
- Concrete footings for each pole (with dimensions shown in the plans),
- Back-to-back mounted 30 inch by 30 inch W11-2, fluorescent yellow green warning signs,
- Back-to-back mounted 21 inch by 15 inch W16-7P, fluorescent yellow green diagonal arrow plaques on each pole, and
- Internal Wiring, conduit, and other miscellaneous equipment.