

ITEM 630 SIGNING, MISC.: SOLAR POWERED RECTANGULAR RAPID FLASHING BEACON (RRFB) PEDESTRIAN WARNING SIGN ASSEMBLY

This work shall consist of furnishing and installing a solar powered Rectangular Rapid Flashing Beacon (RRFB) sign assembly. The flashing unit shall be 2-sided LED, solar powered and pedestrian activated. Multiple units shall be wirelessly controlled and synchronized. The unit shall be compliant with the most current Ohio Manual of Uniform Traffic Control Devices (OMUTCD). The assembly shall also consist of a foundation meeting the requirements of COC STD 4163.

GENERAL REQUIREMENTS

Each RRFB shall consist of two rapidly and alternately flashing rectangular yellow indications having LED array based pulsing light sources.

Each RRFB location shall be a complete assembly consisting of, but not limited to, signage, sign support, sign mounting hardware, RRFB indications, solar panel, and electrical components (wiring, solid-state circuit boards, etc.).

FUNCTIONAL REQUIREMENTS

Each RRFB shall utilize solar power.

Each RRFB shall be activated by ACA compliant pushbuttons.

The RRFB shall be normally dark, shall initiate operation only upon pedestrian actuation, and shall cease operation after a predetermined time limit (based on OMUTCD procedures for calculation of pedestrian clearance intervals).

Each remote RRFB shall be wirelessly activated.

When activated, the RRFB unit indications shall flash in a rapidly alternating "wig-wag" flashing sequence (left light on, then right light on).

All RRFB light indications shall be wirelessly synchronized (all lights will turn on within 120 msec and remain synchronized throughout the duration of the flashing cycle).

Each of the RRFB's indications shall flash at 70 to 80 flashes per minute.

The unit shall be low current/high output including automatic dimming capabilities for day and night visibility.

The unit shall be capable of running up to 30 days without sunlight. If voltages over 50V AC or DC are present, grounding and bonding requirements specified in the CMS shall be followed.

MATERIALS

Furnish a complete assembly, consisting of but not limited to, signage, sign support, sign mounting hardware, RRFB indications, solar panel, and electrical components (wiring, solid-state circuit boards, etc.). The RRFB assembly includes the following items:

1. RRFB indications

- A. Each RRFB indication lens shall be a minimum size of approximately 5" wide x 2" high.
- B. The RRFB indications shall be aligned horizontally, with the longer dimension of the indication horizontal. There shall be two indications on the front and two indications on the back.
- C. Each RRFB shall be supplied with all required hardware to install assembly. All exposed hardware shall be anti-vandal.
- D. Each RRFB shall be located between the bottom of the crossing warning sign and the top of the supplemental downward diagonal arrow plaque.
- E. The light intensity of the yellow indications shall meet the minimum specifications of Society of Automotive Engineers (SAE) Standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) dated January, 2005.
- F. A small confirmation light directed at and visible to pedestrians in the crosswalk shall be installed integral to the RRFB or pushbutton to give confirmation that the RRFB is in operation.

2. Signs

- A. All sign assemblies shall use anti-vandal fasteners to mount components to sign and sign to fixture.
- B. Pedestrian pushbutton signs shall be provided and include the legend "PUSH BUTTON TO TURN ON WARNING LIGHTS". Signs should be mounted adjacent to or integral with each pedestrian pushbutton. The bottom of the sign shall be mounted just above the top of the pushbutton. Mount the center of the pushbutton 42" above the pedestrian pathway surface.
- C. Two sets of signs shall be required per unit for view from each approach.

3. Control Circuit

- A. When activated, the two yellow indications in each RRFB shall flash in a rapidly alternating "wig-wag" flashing sequence (left light on, then right light on).
- B. The control circuit shall have the capability of independently flashing up to two independent outputs. The LED light outputs and flash pattern shall be completely programmable.
- C. As a specific exception to the 2003 MUTCD section 4K.01 requirements for the flash rate of beacons, RRFBs shall use a much faster flash rate. Each of the two yellow indications of an RRFB shall have 70 to 80 periods of flashing per minute and shall have alternating, but approximately equal, periods of flashing light emissions and dark operation. During each of its 70 to 80 flashing periods per minute, the yellow indications on the left side of the RRFB shall emit two slow pulses of light after which and the yellow indications on the right side of the RRFB shall emit four rapid pulses of light followed by a long pulse.
- D. The flash rate of each individual yellow indication, as applied over the full on-off sequence of a flashing period of the indication, shall not be between 5 and 30 flashes per second, to avoid frequencies that might cause seizures.
- E. The control circuit shall be sealed watertight to eliminate dirt contamination and allow for safe handling in all weather conditions.
- F. The LEDs shall be sealed against dust and moisture intrusion as per the requirements of NEMA Standard 250-1991 for Type 4 Enclosure and to protect all internal LED and electrical components.

4. Battery and Solar Panels

- A. Battery unit shall be a 12VDC, 40 AHR minimum, sealed gel or AGM lead acid battery. Batteries shall have a written two year full replacement warranty.
- B. The solar panel shall provide a minimum of 55 Watts peak total output.
- C. The solar panel shall be mounted to an aluminum plate and bracket at an angle of 45 degrees - 60 degrees to provide maximum output.
- D. All fasteners used shall be anti-vandal.

5. Wireless Radio

- A. Radio control shall operate on a 900 MHZ frequency hopping spread spectrum network, Wi-Fi or approved equal.
- B. Radio shall integrate communication of RRFB control circuit to activate sign from pushbutton input.
- C. The radio shall be synchronized so all of the remote RRFB light indications will turn on within 120 msec of each other and remain synchronized through-out the duration of the flashing cycle.
- D. Radio systems shall operate from: 3VDC to 15VDC.

6. Pushbutton

- A. The pushbutton shall be capable of continuous operation over a temperature range of -30 degrees F to +165 degrees F.
- B. Pushbutton shall be ADA compliant.

7. Pedestal Shaft and Base

- A. Pedestal supports shall be coated in accordance with the requirements listed below:

Pedestal Finish requirements:

The coating color on both steel and aluminum products shall match each other. It is the responsibility of the contractor to ensure that both product manufacturers match coating colors so that an excellent looking end product is achieved.

Each coating layer shall be properly cured before the application of the next coat. The application procedure shall be such to warrant a finish without delamination, blistering, or corrosion as per the minimum five (5) year repair warranty.

The coating process shall involve such steps as the following:

- 1. Mechanical preparation: pedestal shafts shall be rotary-sanded to a satin-ground finish. Brackets shall be etched to a matte finish. This treatment will place a rough surface on these items so the base coating layer will have excellent adhesion.
- 2. Cleaning: the bracket and traffic pedestal pole assembly shall be immersed in an alcoholic-phosphoric acid solution that will chemically clean these items. The cleaning solutions shall be kept at a nominal 70 degrees Fahrenheit. The bracket and pedestal assembly shall be immersed in the solvent solution for 5 minutes and then cold-water rinsed until all chemicals are washed off.
- 3. Conversion coating: the bracket and traffic pedestal pole assembly shall then be immersed in an amorphous chromate conversion coating solution for 5 minutes. The solution shall be maintained at 70 degrees Fahrenheit. This treatment will result in the formation of a surface film in which the film chemically bonds itself to the base metal by diffusion and becomes a part of the base metal. The bracket and pedestal assembly shall be cold-water rinsed. This surface will provide optimal adhesion and good stability for the color film so that it does not chip peel, or flake.

- 4. Primer coating: an aluminum primer shall be applied as required to the bracket and traffic pedestal pole assembly to further improve coating adhesion.
- 5. Final coating: each coat shall be properly dried before additional coats are applied. The finish coat of paint shall meet federal standard #595B and conform to color #27038 (semi-gloss black). The finish coat shall have a minimum 5-year repair warranty of coating delamination, blistering, or corrosion.
- 6. Drying: the bracket and pedestal pole assembly shall be thoroughly dried then protected for shipment. All coated items shall be shipped in a manner selected by the manufacturer, which will protect material from damage during delivery. Materials damaged in transit shall be repaired or replaced. All costs associated with correcting damaged material shall be borne by the contractor.

- B. Pedestal supports and foundations shall be as per City of Columbus Standard Construction Drawings 4102, 4105 and 4163.

CONSTRUCTION

The RRFB shall be assembled and constructed by the Contractor as shown and specified on the plans.

WARRANTY

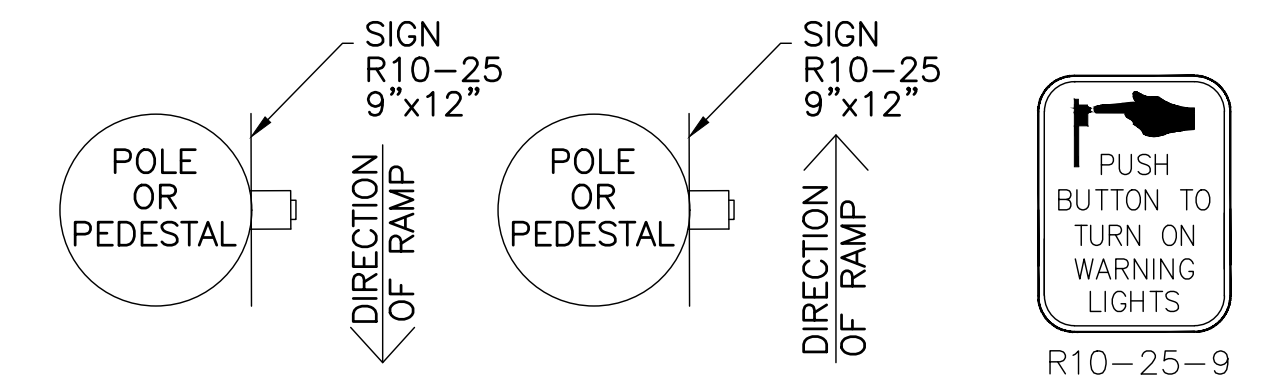
Warranty shall be two years from the date of final acceptance.

MEASUREMENT

The Department will measure the item complete in place, including all materials, testing, labor and software for a fully functional unit.

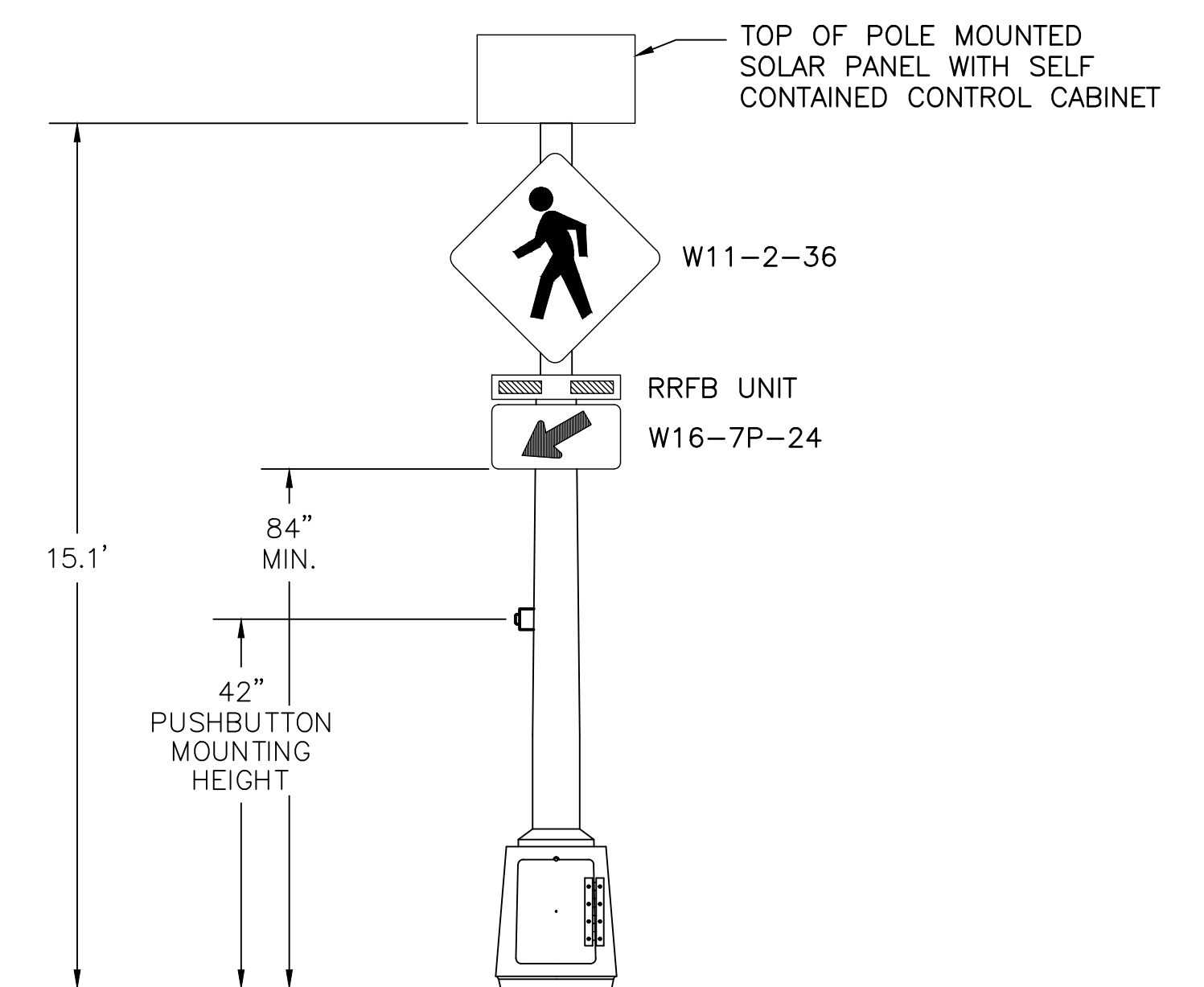
PAYMENT

Payment will be at the contract unit price per each for item 630 "Signing, Misc.: Solar Powered Rectangular Rapid Flashing Beacon (RRFB) Pedestrian Warning Sign Assembly".



NOTE:

THE BOTTOM OF THE SIGN SHALL BE MOUNTED JUST ABOVE THE TOP OF THE PUSHBUTTON.



DESIGNER NOTES:
 1. This sheet is intended as an example of special traffic control devices (RRFB's, School Flashers, Inlaid Markings, rumble strips, etc.). Contact City for current notes and details.

CALCULATED
ABC

CHECKED
ABC

RECTANGULAR RAPID FLASHING BEACON
NOTES AND DETAILS

IMPROVEMENTS OF ...
STREET A FROM STREET B TO STREET C

XXXX-E

