

**SPECIAL PROVISION**  
**SECTION 643**  
**TRAFFIC SIGNALS**  
(Rectangular Rapid Flashing Beacon Assembly)

Amend Standard Specification Section 643 - Traffic Signals as follows:

Add the following to the end of Section 643.01, Description:

This work shall consist of furnishing and installing Rectangular Rapid Flashing Beacons (RRFBs), signage, and associated equipment and appurtenances, in accordance with these specifications and in conformity with the lines, grades, and dimensions shown on the Plans or established herein.

Add the following Section 643.025, Assembly:

RRFBs and signs for each crosswalk shall meet the latest version of the Manual on Uniform Traffic Control Devices (MUTCD) Chapter 4L – Rectangular Rapid-Flashing Beacons.

The following are also required in addition to:

1. Each RRFB Assembly shall include equipment visible for each direction of vehicular traffic unless otherwise shown on the plans. Said equipment shall include two W11-2 signs (one to be a mirrored image for the left side of the road), two W16-7P signs, and two RRFB units.
2. A small light directed at and visible to pedestrians in the crosswalk shall be installed integral to the RRFB to give confirmation that the RRFB is in operation.
3. RRFB must operate between the temperatures of -40° F to +176° F.
4. W11-2 and W16-7P signs shall be MUTCD compliant and fluorescent yellow-green.
  - a. Signs shall be sheet aluminum and meet requirements of Section 645 for Type II regulatory, warning, and route marker assembly signage.
5. Pedestrian activated pushbuttons shall be used.
6. Communication between the devices shall be Spread Spectrum Wireless or direct wire as shown on plans.
7. Each assembly shall have two LED lights mounted to each pole for pedestrian vertical illuminance. One light shall be aimed at the detectable warning field and the other towards the center of the travel lane. Additional requirements for the pedestrian lights are as follows:
  - a. They shall activate in conjunction with the RRFB
  - b. They shall activate when less than 10 lux of ambient light is present and shall not illuminate when the ambient light is equal to or greater than 10 lux
  - c. They shall provide vertical illuminance of 20 lux across the entire crosswalk, measured at a height of 5 feet from the road surface
  - d. They shall be housed in their own IP66 minimum rated enclosures
  - e. They shall be adjustable for 120 degrees horizontally and vertically
8. Each pole shall be outfitted with an 85-watt solar panel, a NEMA 4X aluminum pole mount cabinet, and a 105 Amp-hour absorbent glass mat lead acid battery.

9. The pole shall be a 4-inch inner diameter ASTM A53 Schedule 40 galvanized steel. A cap to make the pole watertight shall be provided at the top of the pole.
10. Each support pole shall be installed with a square aluminum pedestal base with grounding lug.
11. The pole and pedestal base shall conform to the latest edition of “AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals” and National Cooperative Highway Research Program Report 350.
12. All equipment shall be securely attached to the pole with sufficient banding or fasteners.
13. All wiring shall be located inside the pole to the maximum extent possible.

Add the following to the end of Section 643.18, Method of Measurement:

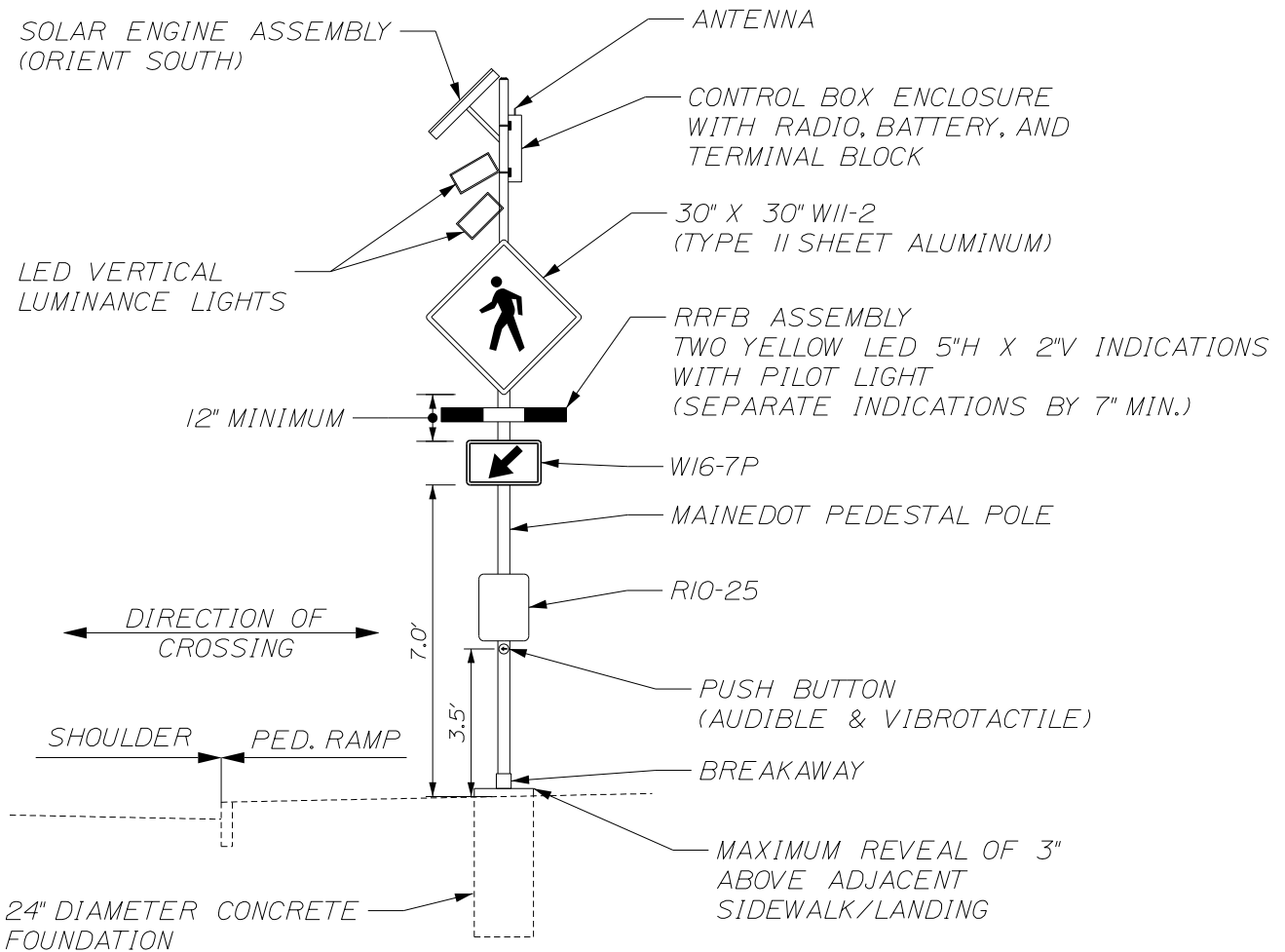
Rectangular Rapid Flashing Beacon Assembly will be measured for payment by each installation complete in place.

Add the following to the end of Section 643.19, Basis of Payment:

Rectangular Rapid Flashing Beacon Assembly will be paid for at the Contract unit price by each. Payment will be full compensation for furnishing all materials including, but not limited to, the RRFB LED-arrays, LED vertical illuminance, controller cabinet, pole and breakaway device, wiring, fasteners, pedestrian push button, signs, solar panel, battery, wireless spread spectrum communication, and all appurtenances and incidentals required for a complete and functioning system. Wiring, grounding, and associated electrical work and materials shall be incidental. Foundations shall be paid for under applicable Section 626 pay items.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
643.621	Rectangular Rapid Flashing Beacon Assembly	Each



**NOTES:**

1. FLASH DURATION FOR CROSSING SHALL MEET MUTCD REQUIREMENTS.
2. INSTALL RIO-25 SIGNAGE AND PUSH BUTTON TO ALIGN TO DIRECTION OF CROSSING.
3. PEDESTRIAN PUSH BUTTONS SHALL BE ADA COMPLIANT AND BE INSTALLED AT 3.5 FEET ABOVE ADJACENT ACCESSIBLE SURFACE GRADE.
4. MAXIMUM ALLOWABLE REACH DISTANCE FOR PEDESTRIAN PUSH BUTTONS IS 10 INCHES. INSTALL EXTENSION BRACKETS IF REQUIRED. PAYMENT FOR EXTENSION BRACKETS WILL BE INCIDENTAL TO RRFB PAY ITEM.
5. ACCESSIBLE PEDESTRIAN PUSH BUTTONS ON RRFB PEDESTAL POLES SHALL BE PROVIDED WITH A SPEECH MESSAGE. SPEECH MESSAGES SHALL BE "(STREET NAME), YELLOW LIGHTS ARE FLASHING FOR (STREET NAME)". SPEECH MESSAGES SHALL BE REPEATED AT LEAST TWICE FOR EACH PUSH BUTTON ACTIVATION.
6. ALIGN WII-2 RRFB ASSEMBLY AND WI6-7p TO FACE TRAFFIC.
7. RRFB GROUPINGS AT EACH CROSSWALK SHALL BE INTERCONNECTED WITH SPREAD SPECTRUM WIRELESS RADIO COMMUNICATIONS.
8. ALL FIELD WIRING SHALL BE NEATLY BUNDLED AND CLEARLY IDENTIFIED WITH PERMANENT, LEGIBLE, WEATHERPROOF TAGS SECURELY ATTACHED TO EACH CABLE.

~ RECTANGULAR RAPID FLASHING BEACON ASSEMBLY DETAIL ~  
 ITEM NO. 643.621  
 (SOLAR POWERED, RADIO ACTIVATED)

TRAFFIC SIGNALS