

Section 657 – Flashing Beacons

657.01 Description. Provide and install beacons and Rectangular Rapid Flashing Beacons (RRFB).

657.02 Materials. Provide materials as specified in:

Concrete	502
Signs and Sign Supports	616
Traffic Signal Installation	656
Traffic Signal Materials	713

Use Class 40 concrete for pole foundations.

A. Beacons. Provide 120-volt AC powered or solar powered beacons as shown in the plans. The AC powered beacon assembly consists of more pole, foundation, flashers (signal indications), signs, controller cabinet, conduit, mounting hardware, and hardware to complete the assembly. The solar powered flashing beacon assembly consists of pole, foundation, solar panel, flashers (signal indications), signs, controller cabinet, battery cabinet, batteries, wireless communications hardware, conduit, mounting hardware, and hardware to complete the assembly.

Provide beacons with two alternately flashing circular yellow signal sections which flash at a rate of not less than 50 or more than 60 times per minute and where the illuminated period of each flash is a minimum of $\frac{1}{2}$ and not more than $\frac{2}{3}$ of the total cycle. Ensure beacons dim to automatically adjust brightness.

Provide NEMA 3R enclosures.

When solar powered, size solar panels and batteries to ensure 100, 30-second, activations per day for up to 14 days between charging. Provide copies of calculations used to size the solar panels and batteries. Ensure batteries are installed in a weatherproof enclosure to ensure that exposure to the weather will not interfere beacon operation.

B. Rectangular Rapid Flashing Beacons (RRFB). Provide 120-volt AC powered or solar powered RRFBs as shown in the plans. The AC powered RRFB assemblies consist of a paired crosswalk assembly of poles, foundations, RRFBs, signs, pushbutton assemblies, controller cabinet, conduit, and mounting hardware. The solar powered RRFB assemblies consists of a paired crosswalk assembly of poles, foundations, solar panels, RRFBs, signs, pushbutton assemblies, controller cabinet, battery cabinet, batteries, wireless communications hardware, conduit, mounting hardware, and hardware to complete the assembly.

Ensure the peak luminous intensity (candelas) meet the requirements of SAE J595, Class 1.

When actuated by a pedestrian, ensure the RRFB provides 75 flashing sequences per minute. Ensure the left and right RRFB indications operate as follows during each 800-millisecond flashing sequence:

1. Illuminate the left-hand side indication for approximately 50 milliseconds.
2. Darken both indications for approximately 50 milliseconds.
3. Illuminate the right-hand side indication for approximately 50 milliseconds.
4. Darken both indications for approximately 50 milliseconds.
5. Illuminate the left-hand side indication for approximately 50 milliseconds.
6. Darken both indications for approximately 50 milliseconds.
7. Illuminate the right-hand side indication for approximately 50 milliseconds.
8. Darken both indications for approximately 50 milliseconds.

9. Illuminate the both indications for approximately 50 milliseconds.
10. Darken both indications for approximately 50 milliseconds.
11. Illuminate the both indications for approximately 50 milliseconds.
12. Darken both indications for approximately 250 milliseconds.

Ensure paired RRFB installations simultaneously illuminate and darken.

Equip each RRFB with an automatic signal dimming device to reduce illumination levels during periods of reduced ambient light.

Provide NEMA 3R enclosures.

When solar powered, size solar panels and batteries to ensure 100, 30-second, activations per day for up to 14 days between charging. Provide copies of calculations used to size the solar panels and batteries. Ensure batteries are installed in a weatherproof enclosure to ensure exposure to the weather will not interfere RRFB operation.

657.03 Construction Requirements.

A. Beacons. Install beacons as shown in the plans. Provide controller enclosure keys.

B. Rectangular Rapid Flashing Beacons (RRFB). Install RRFBs as shown in the plans and manufacturer’s written instructions. Provide controller enclosure keys. When actuated by a pedestrian, operate the RRFBs for 30 seconds unless otherwise specified.

657.04 Method of Measurement. The Engineer will measure acceptably completed work as follows:

1. Beacons will be by per each assembly.
2. RRFBs will be per each assembly.

657.05 Basis of Payment. The Department will pay for accepted quantities at the contract unit prices as follows:

Pay Item	Pay Unit
Beacons, AC Powered	Each
Beacons, Solar Powered	Each
RRFB, AC Powered	Each
RRFB, Solar Powered	Each

Separate payment will not be made for signs or traffic signal materials.