

BOSTON TRANSPORTATION DEPARTMENT
Specification for LED Rectangular Rapid-Flash Beacon (RRFB)
For 120 VAC Power Source

May 1, 2018

General:

The RRFB system shall be compliant with the MUTCD Interim Approval IA-21 for Optional Use of Rectangular Rapid-Flashing Beacons at Uncontrolled Marked Crosswalks. The RRFB system shall include two RRFB units and corresponding BTM W-6 (Pedestrian W11-2) or W-1 (School S1-1) crossing warning sign with a diagonal downward arrow (W16-7P) plaque mounted on BTM standard poles/pedestal bases to be installed on each side of the crosswalk. At each pole, LED displays shall be provided for each direction of travel. **Refer to BTM drawing A42 latest revision.**

The system shall be designed to operate from a 120VAC power source and shall include a small N.E.M.A. cabinet/enclosure with a circuit breaker of appropriate rating and electric meter socket. Proposed N.E.M.A. cabinet shall be submitted to the Boston Transportation Department Engineer for approval.

The system shall be designed to operate over a temperature range from -30F to + 165F.

Wiring diagrams and manuals shall be supplied for all equipment installed as part of the System. Documentation shall involve instructions for set up and troubleshooting of all components in the system.

The system shall utilize an audible information pushbutton device to actuate the RRFBs and a pedestrian instruction sign at a size of 5" x 7 ¾" with the legend "PUSH BUTTON TO TURN ON WARNING LIGHTS" shall be mounted adjacent to or integral with each audible information pushbutton device.

The audible information pushbutton device shall be yellow in color and feature a pushbutton locator tone, a speech pushbutton information message and an audible message when the RRFB is flashing. The audible message, "*Yellow lights are flashing*" shall be programmed to repeat twice at the beginning of the flashing period.

Beacon Dimensions and Placement in Sign Assembly:

- a. Each **RRFB** shall consist of two rectangular-shaped yellow indications, each with an LED-array based light source. Each **RRFB** indication shall be a minimum of 5" wide by 2" high and shall include side-mounted pedestrian LED indicators at each end of **RRFB**.
- b. The two **RRFB** indications shall be aligned horizontally, with the longer dimension horizontal and with a minimum space between the two indications of seven inches (7"), measured from inside edge of one indication to inside edge of the other indication.

c. The outside edges of the **RRFB** indications, including any housings, shall not project beyond the outside edges of the **BTD W-6** or **W-1** sign.

d. A small LED light integral to the pushbutton and side-mounted LEDs at both ends of the **RRFB** indication directed at and visible to pedestrians shall be provided to give confirmation that the **RRFB** is in operation.

Beacon Flashing Requirements:

a. When activated, the **two** yellow indications in each **RRFB** shall flash in a rapidly flashing sequence.

b. The **RRFB** shall have 75 flashing sequences per minute. During each 800-millisecond flashing sequence, the left and right **RRFB** indications shall operate using the following sequence:

The **RRFB** indication on the left-hand side shall be illuminated for approximately 50 milliseconds. Both **RRFB** indications shall be dark for approximately 50 milliseconds.

The **RRFB** indication on the right-hand side shall be illuminated for approximately 50 milliseconds. Both **RRFB** indications shall be dark for approximately 50 milliseconds.

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c. 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.

d. The light intensity of the yellow indications during daytime conditions shall meet the minimum specifications for Class 1 yellow peak luminous intensity in the Society of Automotive Engineers (SAE) Standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) dated January 2005.

e. To minimize excessive glare during nighttime conditions, an automatic signal dimming device shall be used to reduce the brilliance of the **RRFB** indications during nighttime conditions.

Beacon Operation:

- a. The **RRFB** shall be normally dark, shall initiate operation only upon pedestrian actuation, and shall cease operation at a predetermined time after the pedestrian actuation. The predetermined flash period shall be immediately initiated each and every time that a pedestrian pushbutton is activated including when the RRFB is already flashing.
- b. All RRFBs associated with a given crosswalk shall, when activated, simultaneously commence operation of their rapid flashing indications and shall cease operation simultaneously.
- c. The duration of the predetermined flashing period after actuation shall be based on the MUTCD procedures for timing of pedestrian clearance times for pedestrian signals unless otherwise directed by the BTD engineer. This time setting shall be adjustable by the user

Training and Warranty:

Training sessions shall be conducted by the supplier in the setup and troubleshooting of the system. Four (4) hours of training shall be provided during periods to be approved by the Boston Transportation Department Engineer.

The RRFB system shall include a warranty by its supplier for two (2) years from the date of installation.