ITEM # 1117110A – Rectangular rapid Flashing Beacon (RRFB) – Type A

ITEM # 1117111A – rectangular rapid Flashing Beacon (RRFB) – Type B

**Description:** Furnish and install a rectangular rapid flashing beacon (RRFB) at the location indicated on the plan or where directed by the Engineer.

 Each RRFB will be a complete assembly consisting of but not limited to the following:

* RRFB unit with two rapidly flashed rectangular-shaped yellow LED indications
* Controller cabinet (circuit breaker, timer or solid-state circuit boards etc.) or any electrical component hardware
* Pedestal
* Pedestal Foundation
* Pedestrian Pushbutton with accessible features
* Pushbutton Signs
* Mounting hardware
* If Solar, all solar equipment

 **Type A:** Single sided RRFB will contain two rapidly flashed rectangular-shaped yellow

LED indications (two indications on one side facing traffic)

 **Type B:** Double sided RRFB will contain four rapidly flashed rectangular-shaped yellow

LED indications (two indications on each side facing traffic)

**Materials**: The materials for the work shall be specified in the following:

**Article M.16.03 - Pedestals**

**Article M.16.08 – Pedestrian Push Button – as revised by special provision M.16.08**

**Article M.16.10 – Cabinet**

**Construction Method:**

* Each RRFB indication will be mounted on a standard aluminum pedestal and in accordance with dimensions and details shown on the plan.
* Each Solar RRFB will require a location free of any vegetation or obstruction which will inhibit solar charging.
* Each RRFB shall initiate operation only upon pedestrian actuation and shall cease operation after a programed time as shown on the plan or determined by the Engineer (based on MUTCD procedures).
* All RRFBs associated with a given crosswalk (including those with an advance crossing sign, if used) shall, when activated, simultaneously commence operation of their rapid-flashing indications and shall cease operation simultaneously.
* Install the pedestrian pushbutton according to the manufacturer’s instructions.
* Position the pedestrian pushbutton so the plane of the sign face is parallel to the crossing (sign is facing perpendicular) and the arrow is pointing in the same direction as the crossing, not necessarily at the ramp. Notify the Engineer if there is any discrepancy or ambiguity between the plans and field conditions that prevent placement of the pedestrian pushbutton as shown on the plan.
* Set the minimum sound levels of the locator tone and the speech message when there is little or no ambient noise as in nighttime operation. Set the volume of speech message and pushbutton locator tones to a maximum of 5dBA louder than ambient sound. The locator tone should be audible 6’ to 12’ from the pushbutton or to the building line, whichever is less. Confirm the volume of both speech message and the locator tone increases with an increase in ambient sound and subsequently decreases when the ambient noise decreases.

Mechanical and Electrical Requirements:

1. Dimensions:
* Each indication shall be at least 5” wide by 2” high.
* The indications shall be aligned horizontally, with the longer dimension horizontal and with a minimum space of 7” between the two indications
* The outside edges of the indications, including any housing, shall not project beyond the outside edges of the sign that it supplements.

1. Power:
* Hardwired:
	+ AC input, 100-240 VAC, 50/60Hz
	+ DC output, 12 VDC, +/- 1%
* Solar:
	+ DC input, 12 VDC, 55W
	+ DC output, 12 VDC, +/- 1%

1. Temperature & Humidity:
* All components will be capable of continuous operation in accordance with NEMA Standards
1. Indications:
	* + - Flash Pattern:
				* When actuated, the two yellow indications in each RRFB unit shall flash in a rapidly flashing sequence and shall provide 75 flashing sequences per minute.
				* Shall comply with MUTCD <https://mutcd.fhwa.dot.gov/resources/interim_approval/ia21/ia21.pdf>
			- Optics:
				* ITE LED
			- Light Intensity:
				* 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.
				* During nighttime conditions: an automatic signal dimming device shall be used to reduce the brilliance of the indications.
			- Housing Color:
				* Federal Yellow

 e) Control Cabinet:

* Shall be NEMA 3R type

**Method of Measurements:**

 This work will be measured as the number of RRFB furnished, installed and accepted in place.

**Basis of Payment:**

 This work will be paid for at the contract unit price of each “Rectangular Rapid Flashing Beacon (RRFB)” of the type specified which will include the cost of RRFB unit, hardware, controller cabinet complete with all necessary equipment, pedestal, pedestal foundation, pedestrian pushbutton, pushbutton sign, ground rod, ground cable, paint and all materials, equipment, tools and labor included thereto.

The following items will be paid for separately:

* Sign Face – Sheet Aluminum for the warning signs
* (No.) Conductor #()
* (Size) (Kind) Conduit
* Trenching and Backfilling

**Pay Items** **Pay Unit**

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| Rectangular Rapid Flashing Beacon (RRFB) Type A | Ea. |
| Rectangular Rapid Flashing Beacon (RRFB) Type B | Ea. |