A. Purpose

This Manual Part recommends design criteria for an electric light unit for application to highway-rail grade crossing gate arms.

B. Design

1.

2. Design of an incandescent bulb unit should conform to Figure 3240-1.

3.

1.

2. The design of Light Emitting Diode (LED) unit is flexible in geometric shape, size, and in profile and is not constrained by the thermal radiation, size, and optical features required to enclose an incandescent bulb.

4. Incandescent bulb unit or LED assembly units are intended to be supplemental marker lights for the retro reflectorized red and white gate arm, when it moves from a vertical position during periods of dusk and darkness (beyond the reach of normal highway vehicle headlights).

5.

6. 3. Like parts of same manufacturer’s apparatus shall be interchangeable.

7.

8-3. 4. Unit body should be constructed of corrosion resistant or other suitable lightweight material.

9.

10-4. 5. Serviceable light units Means should be provided means for easy removal and replacement of electric lamp or LED assembly.
Incandescent unit body should be provided with a brass candelabra bayonet lamp receptacle on non-adjustable support for electric lamps having a light center for 1-1/4 in (31.75 mm), a single contact base and suitable bulb.

a. Incandescent receptacle shall be electrically insulated from the unit body.

b. Incandescent receptacle shall be adjusted in position at the place of manufacture so that a 1/64 in (0.397 mm) Precision-based lamp will have its filament at the focal point of the lens.
7. LED unit body should be provided with a receptacle for a diode assembly which shall be electrically insulated from the unit body.

Figure 3240-1 Electric Light Unit for Highway-Rail Grade Crossing Gate Arm

Note: Mounting to gate arm optional; use junction box or bracket

8. Unit body shall be so designed that the optical system parts may be cleaned or replaced without disturbing the adjustment of the optical system.

9. Assembly, including wire outlet, shall be designed to conform to Manual Part 11.5.1 Recommended Environmental Requirements for Electrical 4 INCH LIGHT

- 3 -
and Electronic Railroad Signal System Equipment, Class B for abrasive environment to prevent the entrance of salt, rain, sand, hail or dust contaminants.

10.9. Unit body should be provided with insulated flexible copper wire leads or not less than No. 20 AWG (0.518 mm²) when length is less than 6 in. (152.4 mm), otherwise not less than No. 16 AWG (1.31 mm²) will be used for leads of suitable length for connection to the gate arm wiring.

11.10. Light distribution shall be a minimum of 70° deg. horizontal spread and presenting uniform aspect from both sides of the crossing.


b. The light output color shall be highway crossing red. See Manual Part 7.1.10.

12.11. Means for supporting the electric light shall be designed for rigidly fastening to the gate arm and should be a corrosion resistant material.

a. Means should be provided with suitable method for holding lead wires in place.

C. Dielectric Requirements

1. See Manual Part 11.5.1 Recommended Environmental Requirements for Electrical and Electronic Railroad Signal System Equipment, Class B.

2. Lamp receptacle shall withstand for one minute an insulation test of 800 volts vac.

3. LED unit components shall be electrically insulated from the unit body per Manual Part 11.5.1.

D. LED Electrical Requirements

1. LED normal operating range is 8.0 v to 16.5 volts dc or ac rms.

2. In-rush current of LED units shall not exceed 10 Aamps, 100 micro second rise time.

3. LED unit hysteresis (turn on vs. turn off voltage) shall be a minimum of 10% of the nominal rated voltage of the unit.

4. Maximum operating current of 500 mA per light unit.

D. Painting

Unit body should be suitably painted or otherwise treated to resist corrosion.

EE. Identification
Unit body should identify the manufacturer.