Method of Test for

SPECIFIC INTENSITY OF RAISED PAVEMENT MARKERS

DOTD Designation: TR 639-84

Scope

1. This method of test describes the procedure for determining the specific intensity of reflective raised pavement markers.

Apparatus

2. (a) *Light Source* - The light source shall be a film or slide projector having a maximum lens diameter of 1 inch (25.4 mm) and shall be capable of projecting a uniform light to illuminate the entire sample. The projector bulb shall have a rated color temperature of 2854K.

(b) *Sample Holder* - The sample holder shall consist of a goniometer supporting a flat-back test surface which when tested without any sample gives no appreciable reading. The base of the marker shall be parallel to the plane of the floor.

(c) *Photoreceptor* - The reflected light shall be received by a light sensitive photocell and transmitted to an electric receiver which displays the value of the illumination incident upon the photocell. Any of the three photocell-filter combinations listed below are acceptable for use.

(1) Weston: Selenium Barrier Photo Voltaic Cell, Model 594 with Viscor Filter.

(2) International Rectifier: Selenium Photo to Voltaic Cell, Model A15-M with Wratten 102 Filter.

(3) Photovolt Corporation: Electrocell for Model 200 Photometer with Wratten 102 Filter.

The electric receiver shall be a Leeds & Northrup Ayrton shunt or equivalent.

(d) *Photometric Facility* - The light shielded facility shall be painted flat-black inside and all shiny internal components shall be covered or draped with black cloth. The apparatus shall be arranged within the photoelectric facility as shown in Figure 1 with the sample located 50 ft. $\pm$ 2 inches from the projector lens and receiver. The test surface, projector lens and receiver shall be the same distance above the floor. The angles of observation and entrance shall be as shown in Figure 1.

Procedure

3. (a) Test each raised pavement marker as a single unit.

(b) Place the raised pavement marker on the sample holder, and close off the photometric facility.

(c) Verify that the apparatus is positioned as shown in Figure 1.

(d) The observation angle and the entrance angles shall be as designated in the specifications. The presentation angle shall be 90°. The reference axis of the test specimen shall be parallel to the base of the specimen. Turn on the projector and record the illumination incident upon the receiver at the required observation and entrance angles.

(e) Determine the illumination incident upon a plane perpendicular to the incidence ray at the sample position. This is accomplished by removing the sample and setting the photoelectric receiver at the test surface in a position so that the sensitive area of the photocell is perpendicular to the ray from the light projector.

Calculations

4. The specific intensity (SI) shall be calculated as follows:

$$SI = \frac{R_1 (D')^2}{R_2}$$

where:

R_1 = The reading of the photoreceptor while measuring the illuminance at the observation position.

R_2 = The reading of the photoreceptor while measuring the normal illuminance at the face of the retroreflective sample.

D' = Distance between the center of the photoreceptor's entrance aperture and the reference center.

Report

5. Record the specific intensity (brightness) in average candlepower per footcandle per square foot to the nearest hundreth along with the observation and entrance angle.

Normal testing time is 2 hours.

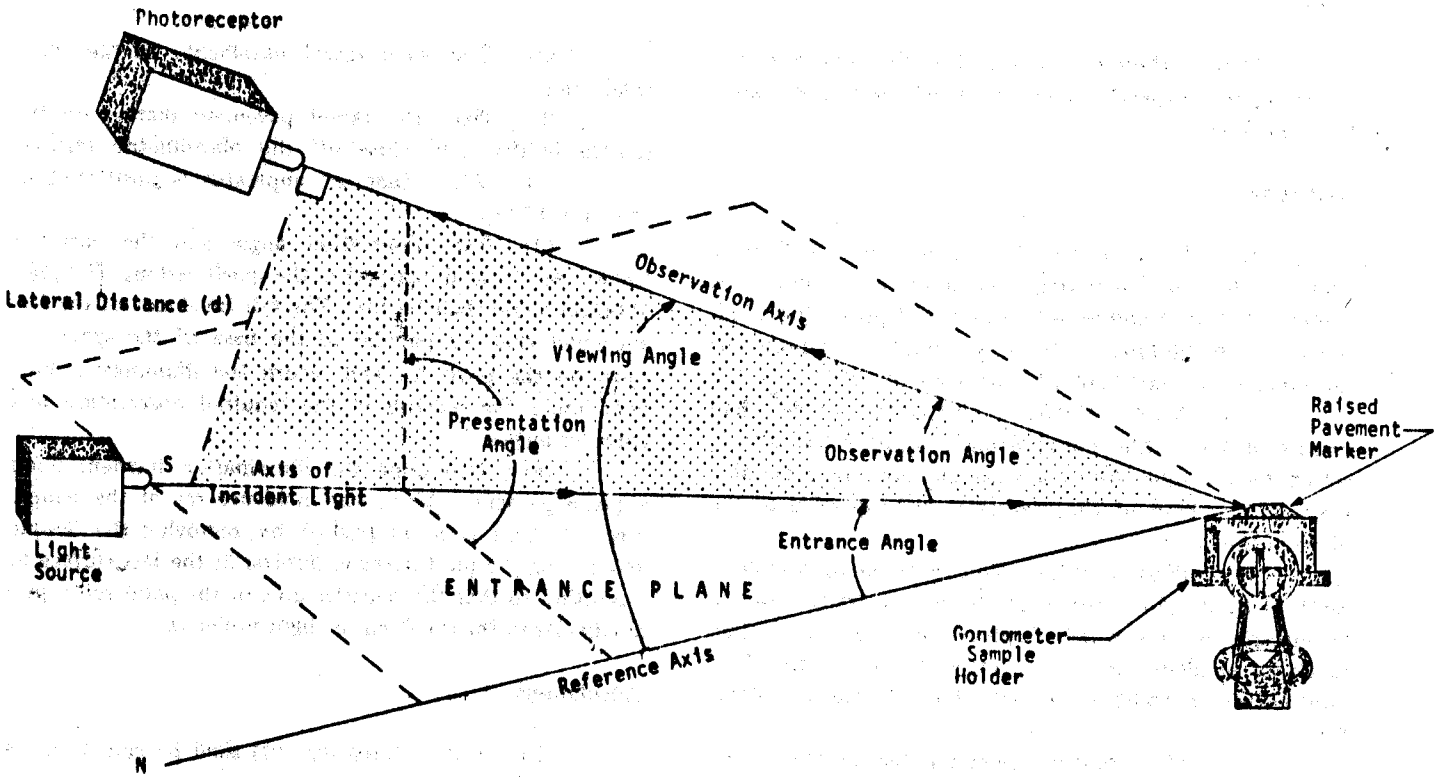

Figure 1