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ENGINEERING SERVICE CENTER
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METHOD OF TEST FOR DEFLECTION OF PLASTIC TRAFFIC SIGNAL FACE

CAUTION: Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read “**SAFETY AND HEALTH**” in Section G of this method. It is the responsibility of whoever uses this method to consult and use departmental safety and health practices and determine the applicability of regulatory limitations before any testing is performed.

A. SCOPE

This method covers the procedure for simulating a wind loading on a plastic traffic signal face and the measurement of the no-load permanent set (deflection) after removal of the load.

B. APPARATUS

1. Rigid steel frame consisting of:
 - a. Base 50.8 mm x 152.4 mm x 1981.2-mm long channel.
 - b. Two Unistruts, 1625.6-mm long.
 - c. Brace to support Unistrut.
 - d. One 304.8-mm long section of 38.1-mm diameter standard steel pipe with 50.8 mm of thread at one end.
2. Two locknuts (type used for signal face housing mounting).
3. One steel washer 9.525-mm thick with 50.8 mm inside diameter and 73.025 mm outside diameter.

4. One serrated nylon washer inserted between plastic signal section and the metal mounting assembly.
5. Three 50.8-mm diameter pulleys mounted on Unistrut.
6. Three “weight holders” with attached cables and weights.
7. Gravity-activated bubble-protractor device.

C. TEST PROCEDURE

1. Mount the traffic signal face (complete with lenses, hoods, backplates and miscellaneous hard-ware) on a rigid frame for front loading as shown in Figure 1 and for back loading as shown in Figure 2.
2. Calculate the test load that will simulate 11.34 kg/m² wind loading applied perpendicular to the signal face (see Appendix).

3. Record the angle of deflection under the pre-load conditions (with weight-holders attached) and with the bubble protector attached to the top of the signal face as shown in Figures 1 and 2.
4. Apply test load slowly and equally, distributed between the three signal sections. Apply test load for a period of 24 hours.
5. After 24 hours, remove the test loads and immediately record the angle of deflection with the bubble protractor.
6. The duration of the test load may be shortened to one hour if the no-load permanent set is less than 95 % of that specified. The test shall be continued for the full 24 hours if the one-hour permanent set is greater than 95 % of that specified.
7. The permanent set shall be the difference in deflection between the pre-load conditions recorded under (3) and after the one-hour or 24-hour period recorded under (6) or (5).

D. REPORTING OF RESULTS

Report test results on Form TL-6039. Report the angle of deflection (permanent set) in degrees, any damage to the signal face or backplate, and whether the test results were obtained under the one-hour or 24-hour test period.

E. DEFINITIONS

The following definitions shall apply to all California Test. Methods that relate to Traffic Signal Heads.

A SIGNAL SECTION is a single light unit consisting of a housing, reflector, lamp receptacle, lamp, lens, door and visor.

A SIGNAL FACE is an arrangement of signal sections which controls one or more traffic movements in a single direction.

A SIGNAL HEAD is an assembly of one or more signal faces.

A STANDARD SIGNAL FACE is composed of all 200 mm or all 300-mm sections.

A COMBINATION SIGNAL FACE is composed of 200 mm and 300-mm sections.

A SIGNAL LENS is that part of the optical unit which redirects the light coming directly from the light source and its reflector.

F. CALCULATION

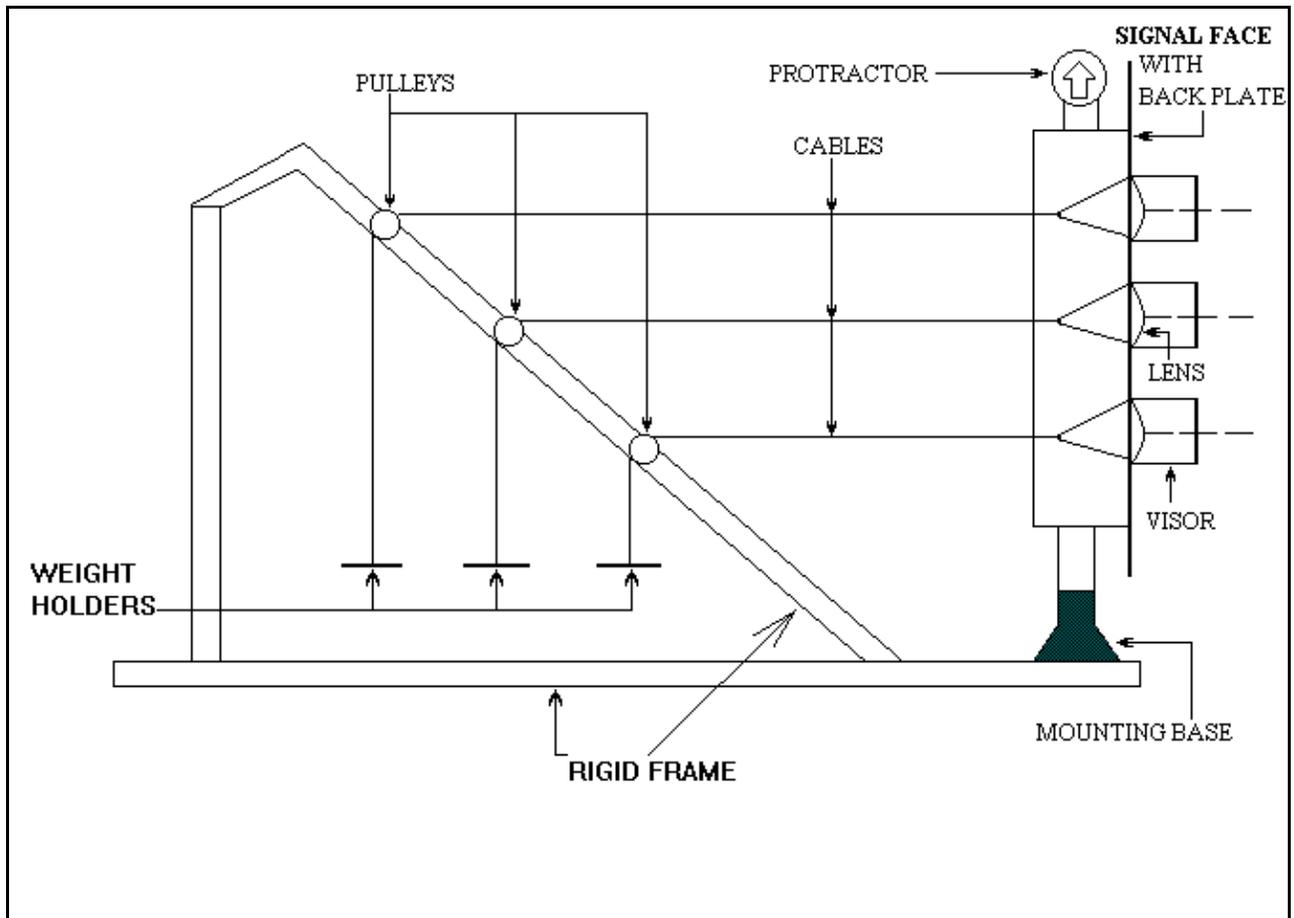
See Appendix on Page 5.

G. SAFETY AND HEALTH

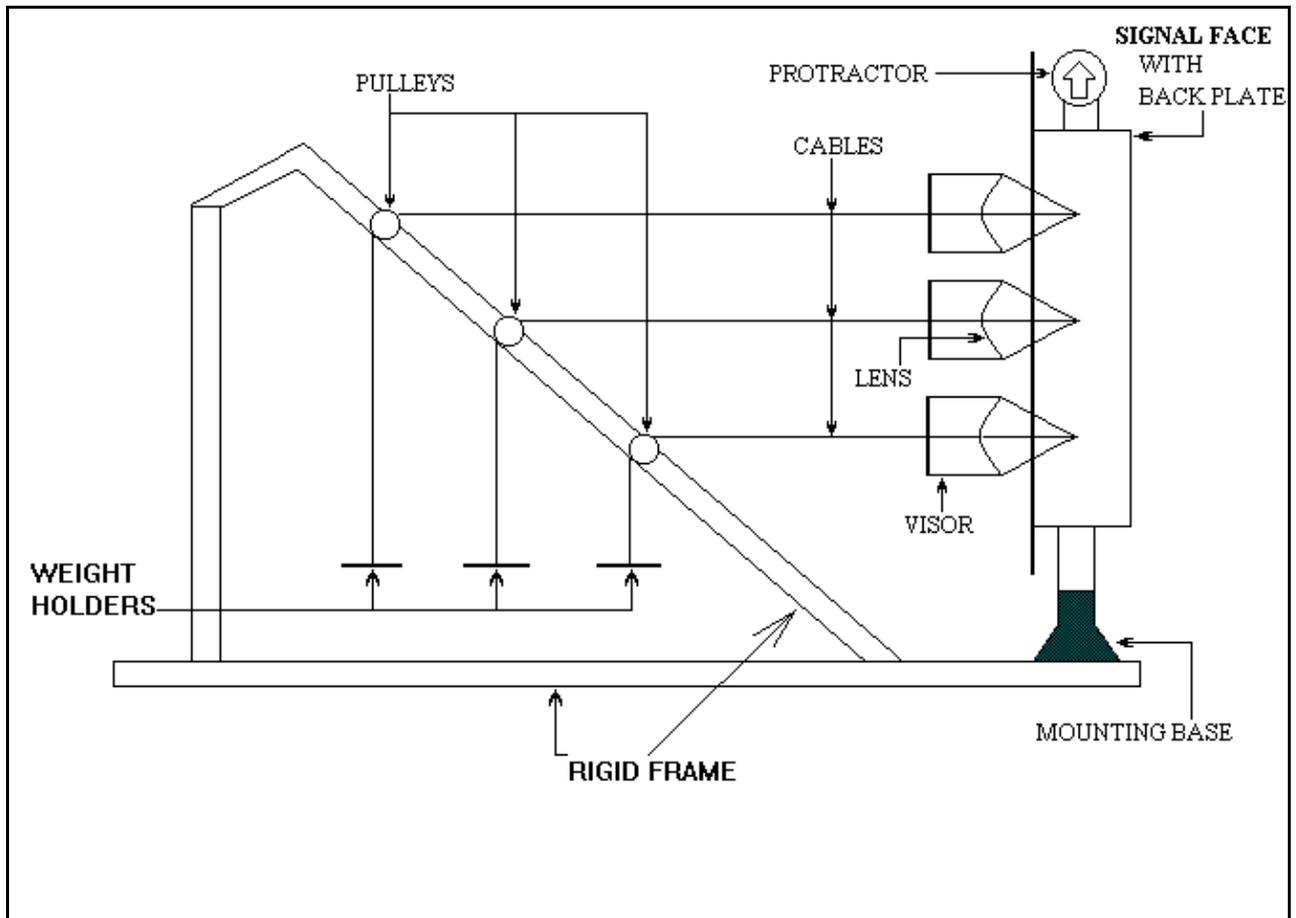
Laboratory Safety

Prior to handling, testing or disposing of any materials, testers are required to read Caltrans Laboratory Safety Manual-Part A, Section 5.0, Hazards and Employee Exposure; Part B, Sections: 5.0, Safe Laboratory Practices; 6.0, Chemical Procurement Distribution and Storage; and 10.0, Personal Protective Apparel and Equipment; and Part C, Section 1.0; Safe Laboratory Practices.

End of Test (California Test 605 contains 5 pages).



**LOADING APPLIED TO FRONT OF SIGNAL FACE
FIGURE 1.**



**LOADING APPLIED TO BACK OF SIGNAL FACE
FIGURE 2.**

APPENDIX

CALCULATION OF TEST LOAD FOR TYPICAL 200 mm SIGNAL FACE

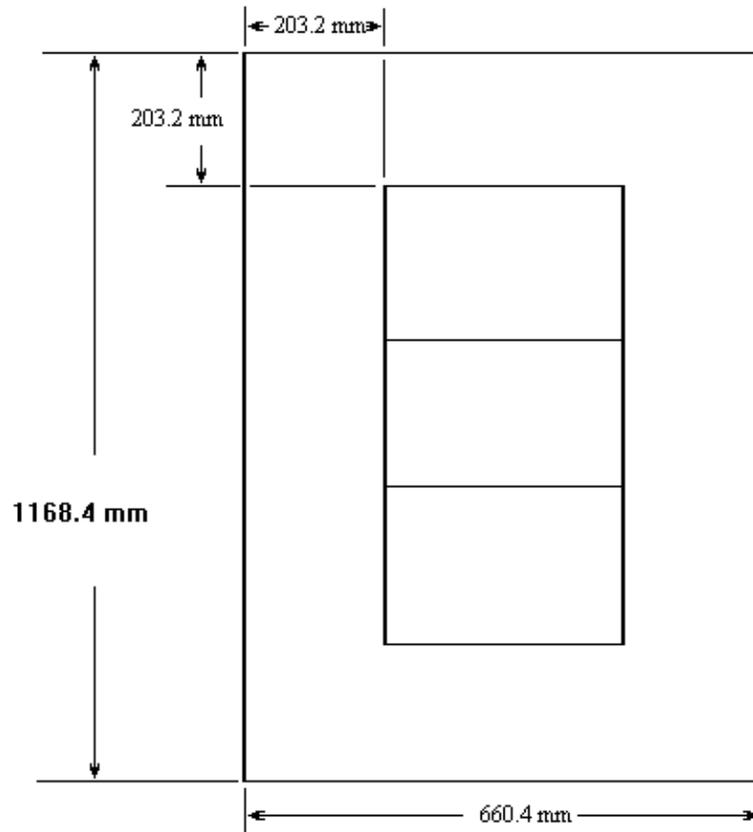


FIGURE 3.

$$\text{Test load} = (11.34 \text{ kg/m}^2) (A)$$

A = Projected area, normal to the direction of loading, of the complete signal face housing including backplate and hoods (square meter)

$$\text{Test Load} = (11.34 \text{ kg/m}^2) \left(\frac{1168.4 \text{ mm} \times 660.4 \text{ mm}}{3657.6 \text{ mm/m}^2} \right)$$

Total Test Load = 94 kg
Load per section = 31 kg