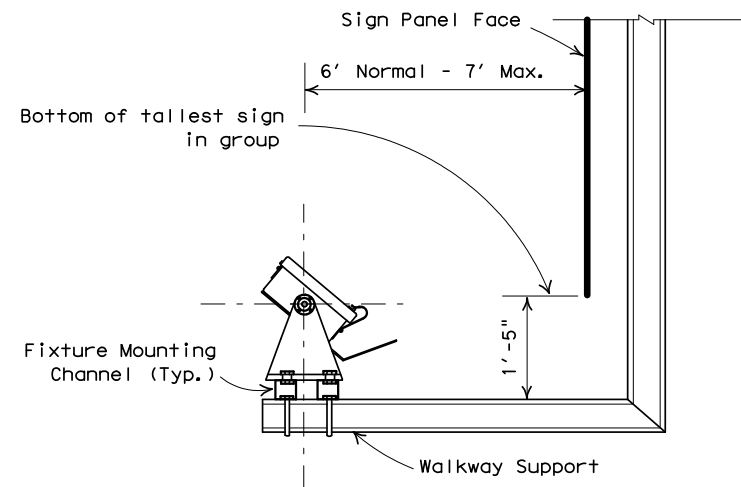
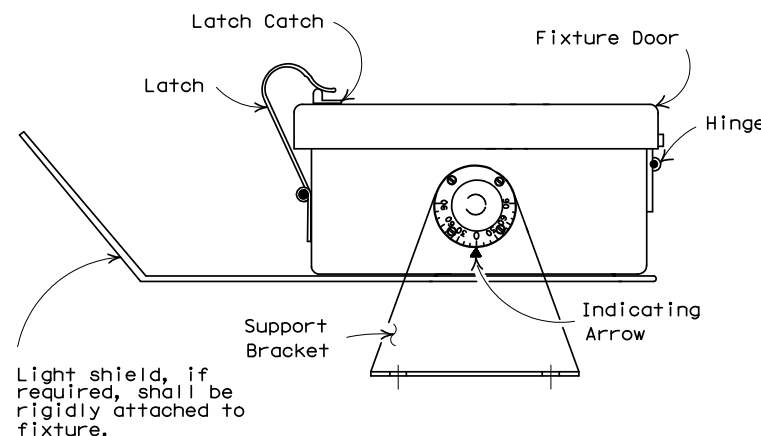


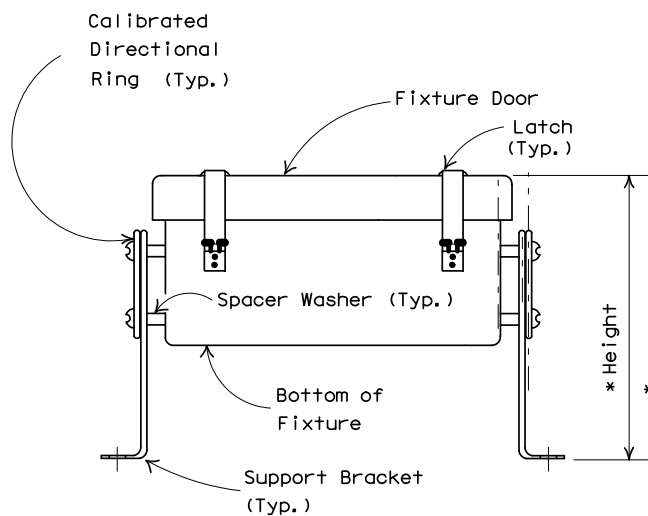
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MOUNTING DETAILS



END ELEVATION



FRONT ELEVATION

Sign Width	END OF SIGN PANEL Q Light Fixtures			
	ES	SL	SL	ES
9'-0"	2'-0"	5'-0"	5'-0"	2'-0"
9'-6"	2'-3"	5'-0"	5'-0"	2'-3"
10'-0"	2'-3"	5'-6"	5'-6"	2'-3"
10'-6"	2'-6"	5'-6"	5'-6"	2'-6"
11'-0"	2'-9"	5'-6"	5'-6"	2'-9"
11'-6"	2'-9"	6'-0"	6'-0"	2'-9"
12'-0"	3'-0"	6'-0"	6'-0"	3'-0"
12'-6"	3'-3"	6'-0"	6'-0"	3'-3"
13'-0"	3'-0"	7'-0"	7'-0"	3'-0"
13'-6"	3'-3"	7'-0"	7'-0"	3'-3"
14'-0"	3'-3"	7'-6"	7'-6"	3'-3"
14'-6"	3'-6"	7'-6"	7'-6"	3'-6"
15'-0"	3'-9"	7'-6"	7'-6"	3'-9"
15'-6"	4'-0"	7'-6"	7'-6"	4'-0"

Sign Width	Q Light Fixtures			
	ES	SL	SL	ES
16'-0"	2'-6"	5'-6"	5'-6"	2'-6"
16'-6"	2'-9"	5'-6"	5'-6"	2'-9"
17'-0"	2'-6"	6'-0"	6'-0"	2'-6"
17'-6"	2'-9"	6'-0"	6'-0"	2'-9"
18'-0"	3'-0"	6'-0"	6'-0"	3'-0"
18'-6"	3'-3"	6'-0"	6'-0"	3'-3"
19'-0"	3'-6"	6'-0"	6'-0"	3'-6"
19'-6"	3'-9"	6'-0"	6'-0"	3'-9"
20'-0"	2'-6"	7'-6"	7'-6"	2'-6"
20'-6"	2'-9"	7'-6"	7'-6"	2'-9"
21'-0"	3'-0"	7'-6"	7'-6"	3'-0"
21'-6"	3'-3"	7'-6"	7'-6"	3'-3"
22'-0"	3'-6"	7'-6"	7'-6"	3'-6"
22'-6"	3'-9"	7'-6"	7'-6"	3'-9"
23'-0"	4'-0"	7'-6"	7'-6"	4'-0"

Sign Width	Q Light Fixtures			
	ES	SL	SL	ES
23'-6"	2'-9"	6'-0"	6'-0"	2'-9"
24'-0"	3'-0"	6'-0"	6'-0"	3'-0"
24'-6"	3'-3"	6'-0"	6'-0"	3'-3"
25'-0"	3'-6"	6'-0"	6'-0"	3'-6"
25'-6"	3'-9"	6'-0"	6'-0"	3'-9"
26'-0"	4'-0"	6'-0"	6'-0"	4'-0"
26'-6"	3'-6"	6'-6"	6'-6"	3'-6"
27'-0"	3'-9"	6'-6"	6'-6"	3'-9"
27'-6"	4'-0"	6'-6"	6'-6"	4'-0"
28'-0"	3'-6"	7'-0"	7'-0"	3'-6"
28'-6"	3'-0"	7'-6"	7'-6"	3'-0"
29'-0"	3'-3"	7'-6"	7'-6"	3'-3"
29'-6"	3'-6"	7'-6"	7'-6"	3'-6"

SPACING FOR 100W MERCURY VAPOR LIGHT FIXTURES PER SIGN PANEL

* Height
* 11 in. max. when properly aimed, see note I. B.

NOTES

I. FIXTURES

A. Fixtures shall be constructed of aluminum, galvanized steel or other approved weather-resistant materials and so constructed as to form a weather-tight unit of sufficient strength to withstand normal installation and maintenance operations. The fixture shall not exceed 2.0 square feet in effective projected area nor exceed 35.0 pounds in gross weight, including ballast.

B. The fixture shall have aiming provisions that are continuously variable through all aiming angles for 15 degrees either side of the optimum aiming angle. Aiming shall be marked in 5-degree increments. Provisions shall be incorporated to positively lock the fixture in the desired position. Mounting provisions shall rigidly support the fixture and be compatible with mounting requirements shown on the plans. When aimed at any of the required angles, the overall height of the fixture above a plane passing through and parallel to the mounting base shall not exceed 11 inches.

C. The optic assembly shall be fitted with resilient gaskets to maintain a positive seal against weather and other contaminants. The lens of the optic assembly shall be tempered glass. Removable covers and lens for fixture and ballast shall be so designed to be opened for routine maintenance without the use of tools. A keeper shall be provided to prevent unintentional separation of lens assemblies or covers from the fixture housing. The metal socket shall incorporate a means to positively resist lamp removal and shall include a porcelain base that completely encases the metal shell. The socket shall be UL-approved.

D. When shown on the plans or required by the Engineer, light shields shall be installed on fixtures to prevent glare to the motorists. All fixtures that are to be installed on bridge-mounted signs shall be equipped with vandal guards approved by the Engineer. Guards and/or light shields will not be paid for directly but will be considered incidental to the Item "Highway Sign Lighting Fixtures".

E. The lighting fixture shown is an example only and is not intended to specify a certain manufacturer's product. Other comparable designs which meet the requirements of the specifications and approved by the Engineer, will be accepted.

II. BALLASTS

A. The fixture may be internally or externally ballasted with a regulated output-type ballast (CW) designed to operate mercury vapor lamps. External ballast shall be in weatherproof encasement.

B. During fluctuation of the primary voltage to the ballast of up to 13 percent of rated voltage, the input wattage to the ballast shall not vary more than 8 percent, nor exceed 150 percent of the lamp's rated wattage. At rated voltage, the power factor shall be not less than 90 percent. Each ballast shall permanently and clearly indicate the following: ballast type, lamp type, catalog number, voltage rating and wiring diagram. When stick-on or glue-on label is used, permanency will be considered satisfactory when no more than 25 percent of the label can be removed in one piece. Ballast shall be individually fused with easily accessible in-line 10 amp time-delay fuses.

III. LAMPS

A. Lamps shall be 100 watt phosphor-coated mercury vapor with a rated average life of not less than 24,000 hours.

IV. PHOTOMETRIC REQUIREMENTS

A. The 100 watt fixture, when mounted vertically six feet (to midpoint of mounting channels) above and horizontally 18 inches below, the midpoint of either short side of a horizontal rectangular area measuring eight feet by ten feet, with the fixture facing the center of the opposite short side, and when aimed at the optimum angle, shall provide measured intensities of not less than 3.0 nor greater than 50 footcandles on any point within the rectangular area. Measured intensities on the surface of the rectangular area shall change at a rate not to exceed 2.6 footcandles in any one foot interval.

B. Optimum angle is that angle which produces equal measured footcandles on all four corners of the rectangular area. The supplier shall state the optimum angle or the indicator mark shall be centered on 0 at the optimum angle.

V. TESTING

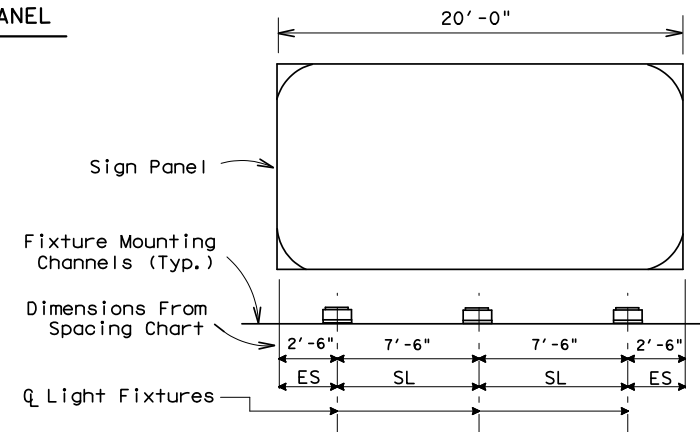
A. Sampling and testing will be in accordance with TxDOT's Division of Materials and Tests Manual of Testing Procedures. The fixture will be tested using a lamp furnished for the same project.

B. The Department will bear the cost of testing all materials meeting the requirements of this drawing. The Contractor will bear the cost of testing all materials failing to meet the above requirements. Costs for testing failed materials will be deducted from amounts due the Contractor on monthly and final estimates.

VI. CONDUIT AND CONDUCTORS

A. Conduit and fittings furnished and installed under this Item shall be in accordance with the Item "Conduit", except for measurement and payment.

B. Conductors furnished and installed under this Item shall be in accordance with the Item "Electrical Conductors", except for measurement and payment.



EXAMPLE OF TYPICAL FIXTURE PLACEMENT (FOR 20'-0" SIGN PANEL WIDTH)



MERCURY VAPOR SIGN LIGHTING FIXTURE

SL (MV) -93

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5-93	REVISIONS			
10-93	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.