

**SECTION 14**  
**SIGN SUPPORTS**

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## **SECTION 14** **SIGN SUPPORTS**

### **14.1 STRUCTURE MOUNTED SIGN SUPPORTS**

#### **14.1.1 General**

A structure mounted sign support is a support that is connected to the fascia member and components of a bridge overpass and supports various types of traffic signs.

#### **14.1.2 Design Responsibilities (Rev. 04/19)**

The dimensions of the sign, the location of the sign over the roadway below, the angle between the sign and the centerline of the roadway below, and the tilt of the sign shall be determined by the Traffic Engineer. The structural designer is responsible for the design and details of the structure mounted sign support required supporting the traffic signs as required by the Traffic Engineer. Structure mounted sign supports require shop drawings that must be reviewed by the designer.

#### **14.1.3 Design Requirements (Rev. 04/19)**

Structure mounted sign supports shall be designed in accordance with the AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*.

The design of all sign support structures shall be based on 120 miles per hour.

Structure mounted sign supports are, by their nature, complex and difficult to model structures. In all but the simplest cases (small signs with virtually no skew), a rigorous three-dimensional analysis is required.

The analysis of structure mounted sign supports shall, in general, be based on pin connected truss members. However, simplified connections, such as angles welded back to back, can sometimes result in substantial eccentricities from the assumed truss nodes. More detailed analysis taking these eccentricities into account may sometimes be necessary in order to reasonably model the structure.

Structures involving larger sign panels and/or significant skew angles may also require more highly detailed and precisely fabricated designs to eliminate eccentricities at the nodes.

Sufficient members shall be employed to brace the structure in all directions and maintain structural stability under all design assumptions. Horizontal rail elements between trusses should be designed as continuous members.

#### **14.1.4 Material Requirements**

The sign supports shall be constructed with structural steel conforming to AASHTO M270, Grade 36. Generally, sign supports are constructed with angles and WT sections except where otherwise required as noted in **BDM** [14.1.3]. The minimum size angle shall be L 4 x 4 x 3/8. The use of metal sign posts as members for structure mounted sign supports is not permitted. All structural steel shall be hot-dip galvanized in accordance with ASTM A123.

High strength bolts shall conform to the requirements of ASTM F3125 Grade A325, Type 1 and be mechanically galvanized in accordance with ASTM B695, Class 50. Carriage bolts shall conform to the requirements of ASTM A307 and be hot-dip galvanized in accordance with ASTM A123.

Welding shall conform to **BDM** [7.1.4].

#### **14.1.5 Detail Requirements**

Generally, structure mounted signs are supported by a framework of trusses connected together with lateral bracing and anchored to the bridge. The trusses, typically composed of angles, should be placed normal to the bridge fascia. The length of the trusses depends on the length of the sign and the angle the sign forms with the bridge fascia (skew angle).

In general, placement of signs on structure mounted supports is discouraged on bridges with skew angles of greater than 30 degrees. If the skew angle becomes excessive, particularly for larger signs, consideration should be given to placing the sign on a cantilever or overhead sign support structure adjacent to the bridge. The height of signs should be kept in reasonable proportion to the height of the sign support frame. Since the height of the frame is limited by the bridge superstructure depth, this limits the height of sign that can reasonably be supported in this manner. In general, the height of the sign should not exceed twice the height of the frame, particularly on bridges with significant skew.

The minimum distance from the sign to the bridge structure must allow for placement of the truss diagonal members. The lowest portion of a structure mounted sign support shall be a minimum of 12 inches above the lowest component of the fascia member of the bridge to which it is attached.

The truss members and lateral bracing are typically connected by shop and field welds. Generally, the truss sections of the supports are field welded to WT sections bolted to the bridge fascia components. Bolted connections to steel members should be made with high strength bolts. Bolted connections to concrete members should be made by bolting

through the component with carriage bolts and a plate washer.

For signs composed of interconnected extruded aluminum sign panels, the signs should be attached to WT members (sometimes referred to as hangers) with post clips. The post clips should be installed for the full height of the WT members on alternate sides. A sign stop should be placed at the bottom of the WT members. All members supporting sign and crown panels shall be positively connected to the sign support framework. The maximum spacing between the WT members is 6 feet. The maximum distance from a WT member to the edge of a sign shall be 3 feet. The minimum distance from a WT member to the edge of a sign shall be 12 inches.

#### **14.1.6 Pay Items**

Structure mounted sign supports shall be paid under the item “Structure Mounted Sign Support” which requires a special provision. The signs are traffic items, and shall be paid for under the appropriate traffic items.

### **14.2 TUBULAR AND TRUSS SIGN SUPPORT STRUCTURES**

#### **14.2.1 General**

Tubular and truss sign support structures refer to the following types of sign supports described in the **Standard Specifications**:

- Tubular Arch Sign Support Structure,
- Tubular Arch Cantilever Support Structure,
- Overhead Truss Sign Support (Type ), and
- Overhead Cantilever Sign Support (Type ).

These sign supports are designed to carry extruded aluminum sign panels. Details for these structures are shown on traffic standard sheets prepared by the **CTDOT**. These structures are designed to be supported by foundations embedded in the ground. The foundation details are shown on standard sheets prepared by the **CTDOT**.

#### **14.2.2 Design Responsibilities**

##### **14.2.2.1 Standard Sign Supports**

The locations and types of tubular and truss sign support structures, the dimensions of the signs, the location of the signs over the roadway below, the angle between the signs and the centerline of the roadway below, and the tilt of the signs shall be determined by the Traffic Engineer.

If the tubular or truss sign support structures will be supported as shown on the standard sheets, no additional design or details are required by the designer. If any of the details on the standard plans are varied or altered, the designer should check all the

details to ensure that they are applicable for the altered conditions.

If the tubular or truss sign support structures will support a sign structure other than an extruded aluminum sign, the designer shall analyze the entire support and foundation. The designer should also check all the details to ensure that they are applicable for the altered conditions.

#### **14.2.2.2 Sign Supports Mounted on Structures (Rev. 04/19)**

The locations and types of tubular and truss sign support structures on a bridge or wall, the dimensions of the signs, the location of the signs over the roadway below, the angle between the signs and the centerline of the roadway below, and the tilt of the signs shall be determined by the Traffic Engineer.

The tubular or truss sign support structures shown on the standard plans are not intended to be mounted on highway bridges, retaining walls or other structures. If an overhead or cantilever support is required to be mounted on a structure, it must be completely designed and detailed by the designer.

These structures shall be designed in accordance with the AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*. The design shall be based on 120 mile per hour wind load, with the appropriate adjustment for height based on the elevation of the structure above surrounding ground or water.

If practical, the sign support materials and details should be similar to those shown on the tubular and truss sign support standard sheets to simplify fabrication and maintain a uniform appearance along the highway.

#### **14.2.2.3 Special Sign Supports**

For sign structures that are to support signs that are not extruded aluminum panels (such as variable message signs), the support must be completely designed and detailed by the designer.

The structure shall be designed in accordance with the AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals*. The design shall be based on 120 miles per hour wind load.

#### **14.2.3 Shop Drawings (Rev. 04/19)**

The tubular and truss sign support structures require working drawings and shop drawings to be submitted by the Contractor.