

## **Additional Information for Shop Drawing Reviews**

Review Sign Structure, Standards, and Pole shop drawings in accordance with contract documents, [Overhead Sign Structures Guide](#), and the information in this Attachment.

Perform an initial review to determine if the shop drawing submittal is complete. Return the document if it is determined to be incomplete. A complete shop drawing submittal will contain the following as a minimum:

1. All items listed under [2018 Standard Specifications \(SS\)](#), Section 56-2.01C(2), *Overhead Sign Structures, Standards, and Poles – Overhead Sign Structures – Shop Drawings*.
2. Identification of the project number.
3. Identification of the sign or pole and their location relative to the contract plans.
4. Identification of individual components including their dimensions and material type.
5. Details showing the orientation of the sign or pole structure.
6. Details showing the orientation of member sections.
7. Welding and other connection.
8. Any proposed changes to the contract documents.

Review the drawings based upon the contract plan sheets, Standard Plan sheets, including any addenda issued prior to the bid opening date, and any revised plan sheets included with the contract plans.

### **Sign Structure Shop Drawing Review**

#### **General**

1. Verify that the location of the sign structure is correct. Refer to the sign plan sheets. Bridge mounted signs will also be shown on the bridge plan sheets.
2. Verify that the direction and orientation of the truss is in the correct plane.
3. Check the electrical plan sheets for any power and communication connections to the structure.

#### **Post**

1. Verify that the top of foundation elevation is not below finished grade. Coordinate with the roadway grading plan sheets. A field survey may be necessary for further confirmation.
2. Verify that the height of the foundation above finished grade is acceptable to the District. There may be aesthetic or safety issues with exposed foundations.

3. Verify the horizontal offset of the pole from the Edge of Travel Way (ETW) is correct. If it is less than 12'-0", additional safety features will be required such as metal beam guard railing. Work with the Resident Engineer to mitigate these situations.
4. Verify that the orientation of hand holes at the bottom of the pole faces away from the traveled way. If the pole is located in the median, consult with the Resident Engineer.
5. Verify the orientation of the base plate bolt pattern matches and supports the correct orientation of the truss or connecting mast arm. This is especially important for non-circular poles or custom poles and arms.
6. Verify the orientation of the post is correct. This is especially critical for non-circular poles or custom poles and arms.
7. Verify the length of pole is sufficient to achieve the required vertical clearance.
8. If there are electrical/communication connections to the structure, verify that appropriate openings are provided in the baseplate and wire supports are provided in the pole. Be sure to check the number and diameters of conduits to verify that they will fit into the baseplate. Consult with the Sign Specialist if the number of conduits or sizes cannot be reduced, requiring an increase to the base plate cutout.

### **Truss and Structural Frame**

1. Verify that beveled washers are specified when fasteners are utilized on sloped steel flange surfaces.
2. Verify that the orientation of the individual truss members is correct.
3. Verify that connection details are specified for all locations.
4. Keep in mind that fillet welds between sections, like the safety railing base plates and support beams, can only be performed when one plate overhangs the other. If both plates are of the same width, a partial penetration weld will be required for this connection.

### **Standards and Pole Shop Drawing Review**

#### **General**

1. Verify that the location of the Standard or Pole is correct. Refer to the sign (S) plan sheets or electrical (E) plan sheets.
2. Confirm that the fabricator is on the Materials Engineering and Testing Services (METS) [Authorized Facility Audit List](#).
3. Verify that the height of the foundation above finished grade is acceptable to the District. There may be aesthetic or safety issues with the exposed foundation.
4. Verify the horizontal offset of the pole from the ETW is correct. If it is less than 12'-0", additional safety features will be required such as metal beam guard railing.

5. Verify that the orientation of hand holes at the bottom of the pole is correct for its position adjacent to traffic.

### **Pole**

1. Verify that the top of the foundation elevation is not below nor too high above the finished grade.
2. Verify that the direction of hand holes at the bottom of the pole face away from the traveled way. If the pole is located in the median, consult with the Resident Engineer.
3. If there are electrical/communication connections to the structure, verify that appropriate openings are provided in the baseplate and wire supports are provided in the pole. Be sure to check the number and diameters of conduits to verify that they will fit into the baseplate. Consult with the Sign Specialist if the number of conduits or sizes cannot be reduced, requiring an increase to the base plate cutout.
4. Verify the orientation of the base plate bolt pattern matches and supports the correct orientation of the pole. This is especially important for non-circular poles.
5. Verify that an installation procedure and/or verification windows are provided for poles and standards that are spliced with slip fit joints. Verification windows provide visual indicators that the upper half of a pole is sufficiently seated into the lower section.

### **Quality Control Plan for Field Installation**

Upon receipt of the field installation plan, perform a cursory review to determine if the document is complete. At a minimum the plan is to address:

1. Personnel: including the identification of the person in charge of the operation.
2. Size, number, and type of equipment being utilized.
3. Method of handling the sign or pole structure component during installation in a safe manner.
4. Make reference to the shop drawings or provide the method of tightening anchor bolts and high strength fastener assemblies.

Return the submittal if this is incomplete. The submittal needs to present a clear plan of how the Contractor will erect the sign or pole structure in a safe and controlled manner.

Some items to consider are:

1. A field check to be performed prior to installation by the Contractor that the foundations are correctly spaced for a two-pole sign structure.
2. The use of tag lines to control the truss or pole during lifting to prevent any unplanned incursions into traffic.

3. The use of a secondary pick line to control the base plate during the erection of the pole or support posts to prevent damage. On larger poles, the baseplate may sustain damage if the pole is tipped up on the edge of the baseplate.
4. Does the plan provide for additional safety measures if the operation occurs at night under lane closure?
  - a. Sufficient lighting?
  - b. Sufficient workspace behind the cones inside the lane closure? Consult with the Resident Engineer if additional space is required or the Contractor proposes to work closer than 6' from the cones.
5. Will the amount of work planned be completed within the allocated work window?