Overhead Sign Structures – Construction

Revision and Approval

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<th>Revision</th>
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Background

This process also establishes Structure Construction (SC) roles and responsibilities for construction inspection of overhead sign and bridge mounted sign structures, including inspection for existing sign structures.

In addition, SC also assists Materials Engineering and Testing Services (METS) with quality assurance of overhead sign and bridge mounted sign structures, including quality control for non-destructive testing, walkway safety railing, and Department acceptance of structural materials. Quality assurance requirements are described in Standard Specifications (SS), Section 56-2.01D, Quality Assurance.

Process Inputs

1. Fabricated and METS released sign structure
2. Overhead sign support structure in place:
   a. Overhead sign structure pile foundation in place per BCM 49-3.02C, Cast-In-Drilled-Hole Concrete Piling – Construction
   b. Overhead sign structure spread or driven pile footing sign foundation in place
   c. Bridge or other structure ready to receive bridge mounted sign structure
3. Notice of Materials to be Used, CEM-3101
4. METS inspection and release documentation
Procedure

List the general steps needed to perform the process with the inputs received to deliver the outputs required. Include links to technical documentation for further information on the procedural step. Don’t get too detailed, leave that for the SC Technical Team to determine.

1. All work associated with this process is charged as Project-Direct – Construction.

2. Inspection of field work for this process is:
   a. Continuous for erection and installation of overhead sign structures.
   b. Benchmark for review of Quality Control Program.

3. Before construction begins:
   a. Review and perform work in accordance with:
      i. Authorized overhead sign structure submittals, per BCM 56-2.01C, Overhead Sign Structures, Standards, and Poles – Submittals.
      ii. BCM 56-2.03 Attachment 1, Sign Structure Installation Guide.
      iii. BCM 56-2.03 Attachment 2, Sign Structure Fastener Installation Guide.
   b. Coordinate with District construction:
      i. Traffic work window for overhead sign structure installation.
      ii. Traffic control.
      iii. All work to be performed during overhead sign structure installation.
      iv. Agency/utility impacts.
      v. Coordination for Department-furnished sign materials.
      vi. Cover sign panels if not for immediate use.
   c. Discuss protocol for overhead sign structure fabrication with the Contractor during the preconstruction conference:
      i. Verification that the fabricator is on the METS Authorized Facility Audit List.
      ii. Use of the CEM-3101, Notice of Materials to be Used, and Form TL-0038, Inspection Request.
      iii. Request contractor notify SR of delivery to fabrication site.
      iv. Discuss any potential issues identified during shop drawing review regarding the authorized shop drawings.
d. Review the Contractor’s CPM schedule for the fabrication, delivery and installation of the sign structure.

e. Request copy of CEM-3101 from RE.

f. Contact MR regarding inspection of materials, fabrication, and welding non-destructive testing of overhead sign structure fabrication:
   i. Forward authorized overhead sign shop drawings and welding quality control plan.
   ii. Verify and obtain a copy of METS inspection forms TL-0028, *Notice of Materials to be Inspected at the Jobsite*, or TL-0608, *Notice of Materials to be Furnished*.

g. Contact the Structure Policy and Innovation (SP&I) Overhead Sign Structure Specialist for technical expertise to resolve irregular construction issues.

h. Review the authorized quality control (QC) program submitted with the shop drawings. See BCM 56-2.01 C, *Overhead Sign Structures, Standards, and Poles – Submittals*.

i. Verify the overhead sign structure location has specified horizontal and vertical clearances.

j. Prepare Form *TR-0020, Notice of Change in Horizontal or Vertical Clearance*, and submit to the Construction/Maintenance Liaison (Permits) with horizontal and vertical clearances. Report the impaired clearance 15 days prior to erecting sign structure over traffic.

k. Verify the concrete elements supporting the overhead sign structure have attained the required time and compressive strength.

l. Verify the height and elevation of anchor bolt assembly (when applicable).

m. Verify the inspection and release of the overhead sign structure with MR.

n. Upon delivery of the overhead sign structure:
   ii. Check for Certificates of Compliance and Buy America Certification.
   iii. Review *Construction Manual*:
      1. *Table 6-2.1, Inspection of Fabricated and Manufactured Materials*.
      2. *Table 6-2.2, Materials Acceptance Based on Authorized Material List*.
      3. *Table 6-2.3, Materials Accepted by Certificate of Compliance*.
   iv. Check the sign structure for damage incurred during the delivery:
      1. If any damage is discovered, request a repair plan from the contractor.
v. Check the walkway safety railing wobble per the requirements of the contract documents.

vi. Verify the overhead sign structure delivered is the correct one authorized for the specified location and orientation with the roadway.

vii. Verify that all connection hardware complies with the contract requirements, have been authorized, and/or are listed on Authorized Material Lists (AML), etc.

viii. Contact the MR if no Form TL-0029 was received or there are no inspection release tags.

ix. Check the overall condition of the overhead sign structure to verify compliance with the contract requirements.

x. Authorize installation of the overhead sign structure if it conforms to the requirements of the authorized shop drawings.

o. Department-furnished material:

i. Review the contract for any requirements for Department-furnished material.

ii. Resident Engineers will coordinate for Department-furnished sign materials to be ordered and ready for timely delivery.

iii. Make a physical inspection and inventory to confirm that all Department-furnished sign materials are delivered in good condition.

iv. Verify correct spelling of messages on sign panels.

v. After delivery, the Contractor is responsible for any damage to Department-furnished materials.

4. During construction:

a. Review lane closure request to verify that the duration and closure limits are sufficient to support the operation and provide feedback to the Resident Engineer.

b. Conduct a pre-erection meeting with the Contractor to discuss:

   i. The Installation Quality Control Program

   ii. Safety (work lights, COZEEP, contingency plan, etc.)

   iii. Splices

   iv. Inspection hold points (if necessary)

   v. Fastener installation and timing of verification

   vi. Verification of staging area (and closure limits) for equipment and installation

c. Field procedures for installation of new or relocated overhead sign structures and bridge mounted signs:
i. SR disseminates the latest authorized QC program and shop drawings to all SC field staff:
   1. Verify that the Contractor is using the same copy.

ii. Coordinate inspection with the MR for any field welding. Review WQCP and check Certified Welding Inspector (CWI) requirements.

iii. Coordinate installation of conduits, boxes, and other electrical appurtenances with the District. For relocated structures, verify openings are sized to support new conduit installation.

iv. Overhead sign structures:
   1. Verify that installation of the structure complies with the project requirements and conforms to the authorized Quality Control Plan.
   2. Deviations to the QC program require discussion with the Structure Representative prior to the change.
   3. Verify installation of the fasteners through Direct Tension Indicators (DTI) or torque, verified by an approved method. See Attachment 2, Sign Structure Fastener Installation Verification Guide.
   4. Verify that the tightening of anchor bolt nuts for poles is performed incrementally and in an alternating pattern to evenly apply force to the connection. Anchor bolts are tensioned to a snug tight condition unless otherwise specified.
   5. Verify rake (lean) of the posts, such that the truss, will be level relative to the traveled way.
   6. Verify that the measured impaired is greater or equal to the clearance previously reported to Construction/Maintenance Liaison (Step 3j). Do not allow sign structure to be installed if the measured clearance is less than the previously reported. Discuss with SR for corrective action. Report final values to the Construction/Maintenance Liaison.
   7. Verify that mortar is placed under base plate per Standard Specification (SS). ¹

v. Bridge mounted sign structures:
   1. Verify that anchors have been or will be installed in accordance with the manufacturer’s recommendations to the correct position and dimension.
   2. Verify that anchorages will not penetrate prestressing ducts in post-tensioned box girder bridges.
   3. Resin capsule anchorages (RCAs) are restricted to certain conditions:

¹ 2018 SS, Section 56-3.01C(2)(a), Overhead Sign Structures, Standards, and Poles – Construction – Foundation – General
a. Do not allow their usage in positions where the anchorage is subject to
direct, sustained tension.

b. Their usage is allowed when attachments are made in specific locations.
Refer to Attachment 2, Sign Structure Fastener Installation Guide and the
Overhead Sign Structures Guide for additional guidance on the use of
resin capsule anchorages and locations where their usage is allowed.

vi. Upon completion of installation, verify that all temporary shipping, and lifting
attachments are removed from the structure. Have the Contractor repair any
damage to the structure resulting from the removal of these attachments, including
galvanization or painting systems per SS.2

vii. Measure horizontal and vertical clearances and report if less than those provided
from previous notice per BCM C-4.14, Notice of Change of Structure Clearance or
Permit Rating:
1. Record As-built elevations (and vertical clearance) on sign detail plan sheets.

d. Existing Sign Structures:

i. Remove or salvage overhead sign structure:
1. Confirm removal depths of foundation with the Contractor.
2. Request, review, and authorize removal plan.
3. Coordinate with receiving site on the timing of a salvage operation (when
applicable).

ii. Modify overhead sign structure:
1. Review the condition of the structure.
2. Verify that existing structures to be modified agree with as-built drawings.
3. Initiate a Change Order to replace any portion of the structure that cannot be
reused.

5. Refer to Attachment 1, Sign Structure Installation Guide, for complete instructions.

6. Authorize installation of the overhead sign structure if it conforms to the requirements of
the authorized shop drawings.

7. Document all field revisions to the contract documents in as-builts. Provide copy to
pertinent party.

8. Document all inspection, construction, and quality assurance activities in the Daily
Reports per BCM C-4.04, Daily and Weekly Reports.

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2 2018 SS, Section 75-1.02B, Miscellaneous Metal – Materials - Galvanizing
Process Outputs

2. Form TR-0020, *Notice of Change in Vertical or Horizontal Clearance*.
3. Field welding QA forms (if field welding is performed).
4. Welding Inspection Reports.
5. Buy America Certification from the manufacturer for Federal Aid projects.
6. Certificates of compliance.
7. Daily Reports.
8. As-builts.
9. Installed overhead sign structure.

Attachments

**Attachment 1**, *Sign Structure Installation Guide*.

**Attachment 2**, *Sign Structure Fastener Installation Guide*. 