

Section 67 Structural Plate Culverts

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Section 67 Structural Plate Culverts

4-6701 General

This section provides guidelines for inspecting structural plate culverts for work specified under Section 67, “Structural Plate Culverts,” of the *Standard Specifications*. This work includes fabricating and constructing structural plate culverts as pipe, arches, and pipe arches that are assembled in the field from structural steel or structural aluminum plates. The plans and specifications designate the number and thickness of plates in each installation.

4-6702 Before Work Begins

Before work begins, take the following steps:

- Sufficiently in advance of the contractor’s start of operations to prevent conflicts in scheduling or errors in ordering materials, review the contract plans, *Standard Plans* (sheets A62F, D88A, and B14-1, as appropriate), and specifications. Inspect the site of each planned installation.
- Note any unsolved drainage problems and make necessary changes by change order.
- As soon as final locations and lengths are determined, furnish the contractor a revised pipe list.
- Verify that Form CEM-3101, “Notice of Materials to Be Used,” includes all fabricated materials. Refer to Section 6-202, “Responsibilities for Acceptance of Manufactured or Fabricated Materials and Products,” of this manual for additional information.
- Before assembling the structural plates, ensure the receipt of the manufacturer’s assembly instructions. Ensure the instructions conform to the plans and specifications.

4-6703 During the Course of Work

During the course of work, do the following:

- Upon delivery of the structural plate materials, note whether it is identified by marks or inspection tags (Form TL-0624, “Inspection Release Tag”). Check the materials for damage that may have occurred after inspection at the source.
- Also, upon delivery, note the condition of the pipe. Require the repair of minor damage to galvanizing or bituminous coatings. Do not accept repair of serious damage, such as buckled, bent, cracked, or torn plates. Reject plates with damage of this extent.
- Double-check to ensure the proper type, size, and thickness of pipe at each location.

- If mastic for protective coating will be field applied, ensure an inspector from Materials Engineering and Testing Services (METS) has inspected the material.
- Normally, the METS inspector will have obtained the certificates of compliance or mill test reports. If materials are properly identified as previously inspected, project personnel do not need these documents.
- Before structure excavation, require that embankments be constructed as specified. Note the requirement on the plans for shaped bedding.
- Require assembly according to the manufacturer's instructions. The following items must comply with instructions and specifications:
 1. Sequence of placing plates
 2. Longitudinal and circumferential joints and laps
 3. Types and sizes of bolts and nuts to be used
 4. Manner of bolt placement
 5. Number of bolts to be placed before tightening
 6. Bolt-tightening sequence and torques
 7. Type of end treatment
- Check maximum as well as minimum torque to ensure they comply with the requirements in Section 67-2.03, "Construction," of the *Standard Specifications*. During the checking of torque, insist on an adequate working platform and safety devices to prevent injury in case of the shearing of a bolt or the breaking or slipping of a torque wrench.
- Refer to the *Standard Plans* for the design of required strutting and for the minimum cover for construction loads. Require that minimum fill conditions, as shown on the plans, are met for construction loads on culverts.
- When bituminous coating is required, determine that all bolts on the outside of the pipe are coated with mastic before backfill. When coating is field applied, require the sealing of all joints before backfill.
- Refer to Section 4-19, "Earthwork," of this manual for instructions on inspecting backfill. Refer to Section 4-61, "Drainage Facilities—General," of this manual regarding slurry cement backfill.
- Throughout the progress of the work, periodically inspect installed pipes and arches. If any structural deficiencies are discovered, ensure these are corrected before the start of base or surfacing, where pipes or arches underlie pavements.
- Before recommending acceptance of the contract or making a recommendation to grant relief from maintenance, require the contractor to clean all pipes and arches if necessary.

4-6704 Level of Inspection

Suggested levels of inspection for typical structural plate culvert work are:

4-6704A Structural Metal Plate Pipe

- Intermittent inspection of assembly
- Benchmark inspection of strut placement and removal
- Continuous inspection of bolt tightening to specified torque
- Benchmark inspection of repair to damaged galvanizing
- Intermittent inspection of application of protective coating
- Benchmark inspection of repairs to protective coating
- Benchmark inspection of connection to inlet or outlet structures to ensure ends of pipe are cut flush with the structure face

4-6704B Metal Liner Plate Pipe

- Intermittent inspection of excavation, assembly, and grouting
- Benchmark inspection of repair to coating
- Continuous inspection of bolt tightening to specified torque

4-6705 Quality Control

While specific levels of quality control sampling and testing for structural plate culverts are not included in Section 67, “Structural Plate Culverts,” of the *Standard Specifications*, the contractor is responsible for providing quality control under Sections 5-1.01, “General,” and 6-2.02, “Quality Control,” of the *Standard Specifications*.

4-6706 Payment

Refer to Sections 67-2.04, “Payment,” and 67-3.04, “Payment,” of the *Standard Specifications* for payment information on structural metal plate pipe and metal liner plate pipe, respectively.