

## SECTION 500 – STRUCTURES

### 508.00 Corrugated Plate Pipe.

**General.** Structural metal plate pipe includes steel and aluminum pipes and pipe arches that are assembled in the field. The plans and specifications designate the number and thickness of the plates in each installation.

Sufficiently in advance of the start of the Contractors' operation the Resident Engineer and inspectors should review the contract plans and each site to note any potential problems including drainage.

Typically the specifications do not require the Contractor to submit shop drawings for approval. If deemed necessary the requirement should be added to the specification prior to bid, otherwise a change order will have to be executed. If required, have the Contractor submit shop drawings and a detailed fabrication and erection plan for each pipe that shows the position of each plate and the order of assembly prior to fabrication of the structural steel plate sections. The Resident Engineer should review these and forward them to the designer for approval.

Upon delivery note the condition of the pipe plates. Require the repair of any minor damage to the galvanizing or bituminous coatings. Plates with serious damage such as having buckled, bent, cracked or torn areas should be rejected. Double check to ensure the proper type, size and strength of the plates are being used and that they match the certifications provided.

Before assembling the structural plates ensure you have received the manufacturer's assembly instruction and check these to ensure they conform to the plans and specifications. Resolve any differences before proceeding.

**Construction Requirements.** During the construction the following areas should receive special attention:

- Bedding and shaping of the foundation should conform to the requirements for conduits. A foundation with uniform bearing capacity is essential. Special bedding or backfilling materials or procedures will be outlined in the special provisions.
- Ensure the sequence of plate placing and the longitudinal and circumferential lapping of the joints are occurring per the manufacturer's written recommendations.
- Generally the structure should be assembled with as few bolts as possible until all the plates are in place. After several rings have been assembled the remaining bolts can be inserted, always working from the center of the seam to the corner of the plate. Corner bolts should be inserted after all other bolts are in place and tightened. Again follow the manufacturer's written recommendations.
- After all the plates have been assembled and bolted the nuts are to be tightened progressively and uniformly starting at one end of the structure and moving toward the other. Uniformity of tightening is important as is staying within the approved torque range. The minimum and maximum allowable torque depends upon the type of the structural plate.

- High strength steel bolts are required by the specifications to be used in assembling the plates. Bolt heads are marked with three radial lines 120 degrees apart. See [CA Section 504](#) for additional information. Bolt/nut sizes, types, manner of placement, torques and the tightening sequence must be in accordance with the manufacturer's written recommendations.
- Damage to the galvanizing or coating can occur during erection especially around bolt holes. Damage should be repaired with an approved paint/material as soon as it occurs. Generally, two coats are advised.
- Verify that the type of end treatment is per specification.
- Ensure any strutting is done according to approved plans and procedures.
- Ensure equally placed layers of backfill on each side of the structure are occurring to prevent warping and movement.
- Verify backfill material compaction under the haunches meets specifications.
- Ensure that the minimum cover conditions as shown on the plans are met for the proper distribution of the construction loads on the culvert.
- Prohibit the use of any cementitious product being placed in contact with an aluminum component and ensure clean-up of the area after the work.
- As in all construction operations, ensure that adequate work platforms and safety devices are present to prevent accidents.

**Documentation for Pay Quantities.** Complete field notes will be required for the computation of structural excavation and compacting backfill. The length should be measured in the field and the pay quantity entered on diary or pipe sheet, if being used. The diary shall be used to verify the activity date and location of the work. Corrugated plate pipe will be measured and reported to the nearest 1.0 ft.

**Reports.** None.