

# Rehabilitation Solutions: Corrugated Steel Pipe

As the nation's infrastructure ages, and service conditions and requirements change, the challenge to keep structures safe and workable requires innovative solutions. Heavy replacement costs and expensive loss of service time and utility can be avoided by using Corrugated Steel Pipe (CSP) rehabilitation systems which facilitates the rehabilitation and extension of useful life of storm sewers, culverts and bridges.



# REHABILITATION SOLUTIONS

It is possible to salvage failing structures and eliminate the expense of lost time, the inconvenience of road closures, loss of hydraulic capacity, and cost of overcoming safety problems connected with complete replacement. CSP systems have been employed for almost a century in rehabilitation projects with a saving in cost and reduction of disruption created by removing old structures. Lining inadequate or failing structures with CSP systems uses little of the available space within the structure. This preserves the maximum amount of the original opening. CSP hydraulically efficient linings, wall profiles, and corrugation profiles can often allow a smaller structure to provide the same hydraulic capacity as the original.

**VARIETY OF SHAPES** Existing pipes and arches are generally lined with structures of the same shape, though of a slightly smaller size. Rectangular openings can be lined with round, elliptical, or pipe-arch structures. Corrugated steel structures can fit almost any existing shape.



**BACKFILLING** Grout is generally placed in the space between the old and new structures. Correctly installed, grout prevents further distortion of the old structure and minimizes concentrated loads on the new lining. Fill material can be sand, "sand-cement" mixes, grout and flowable fill, or concrete mix. The choice of fill depends on the type of structure, void area, strength requirements, and equipment available for the work.



**COST EFFICIENT**

**DURABLE**

**ENVIRONMENTAL**



**REHABILITATING BRIDGES AND LARGE CULVERTS** Bridges and large culverts can be relined by erecting corrugated steel plate structures inside the existing structure. Or, the new plate lining can be erected outside and threaded into the existing openings. The plates, bolts, and nuts are delivered to the jobsite unassembled. The plates and ribs are easily bolted together to form any of the required shapes:



round, vertical and horizontal ellipse, pipe-arch, underpass and arch.

## SPECIFICATIONS

### ASTM/AASHTO

ASTM A760/A760M  
AASHTO M-36M  
Standard Specification for CSP, Metallic-Coated for Sewers and Drains

ASTM A761/A761M  
AASHTO M-167/M 167M  
Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches

ASTM A762/A762M  
AASHTO M-245M  
Standard Specification for CSP, Polymer Precoated for Sewers and Drains

ASTM A796/A796M  
Standard Practice for Structural Design of CSP, Pipe-Arches, and Arches for Storm and Sanitary Sewers

ASTM A798/A798M  
Standard Practice for Installing Factory-Made CSP for Sewers and Other Applications

ASTM A807/A 807M  
Standard Practice for Installing Corrugated Steel Structural Plate Pipe for Sewers and Other Applications

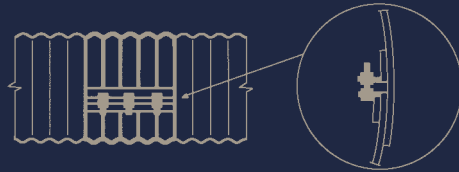
AASHTO M-190M  
Standard Specification for Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches

AASHTO  
Standard Specifications for Highway Bridges Division 1, Section 12: Soil Corrugated Metal Structure Interaction Systems

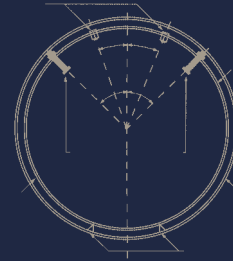
AASHTO  
Standard Specifications for Highway Bridges Division 2, Section 26: Metal Culverts



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internal expanding type coupling band



typical section of  
corrugated steel pipe  
fabricated for sliplining