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**5.23 SUPPLY OF CORRUGATED METAL PIPE AND PIPE ARCHES**

5.23.1 GENERAL

This Specification covers the requirements for the supply of corrugated metal pipe and pipe arches up to 1400 mm equivalent diameter by the Contractor.

Abbreviations for the various types of metal pipe are as follows:

- C.S.P. Corrugated Steel Pipe
- C.S.P. Arch Corrugated Steel Pipe Arch
- C.A.P. Corrugated Aluminum Pipe
- C.A.P. Arch Corrugated Aluminum Pipe Arch

5.23.2 MATERIALS

The Contractor shall ensure that the supply and fabrication of all galvanized, polymer coated and aluminum coated corrugated steel pipe (CSP) and pipe arches including couplers and appurtenances are in accordance with the latest edition of Canadian Standards Association (CSA) G401 Specification, and the supply and fabrication of corrugated aluminum pipe (CAP) and pipe arches including couplers and appurtenances are in accordance with the latest edition of AASHTO Designation M196 and M197, with the following modifications:

Previously installed pipe shall not be used. All pipe supplied shall be clearly marked with the following information at intervals of not more than 3 m.

- Manufacturer’s Name or Trade Mark
- Nominal Thickness and Type of Metal
- Plate/Metal Coating ( for non-standard coating)
- Specification Designation
- Plant Designation Code
- Date of Manufacture

5.23.2.1 **Sloped End Sections**

Sloped end sections are required for each culvert. When 4:1 and 3:1 sloped end sections are specified, templates CB6-5.15 M1 and CB6-5.15 M2 will apply.

5.23.2.2 **Cut Ends**

All cut edges of a sloped or square end section shall be made smooth by grinding so that all of the burrs are removed and the damaged zinc coating shall be recoated with appropriate material in accordance with CSA G401.

5.23.2.3 **Couplers**

Annular corrugated couplers for pipe greater than 300 mm in diameter shall be of sufficient width to cover at least two outside crest corrugations on each recorrugated end.

**5.23.2.4 Coupler Bands**

Coupler bands for pipe greater than 800 mm in diameter shall have a minimum of three bolts.

**5.23.2.5 Termination of Lock Seams**

On pipes 1000 mm diameter or larger, lock seams terminating at the cut edges of sloped or square ended sections shall have a 75 mm length fillet weld run along the lock seam at each cut edge. The weld and surrounding area shall be recoated with the appropriate material in accordance with CSA G401.

**5.23.2.6 Recorrugated Ends**

Spirally corrugated metal pipe shall have ends recorrugated to provide annular corrugations for couplers.

**5.23.2.7 Perforated Pipe**

Perforated corrugated steel pipe shall be fabricated in accordance with the latest edition of CSA G401 (Currently Section 4.1.6).

**5.23.2.8 Double Zinc C.S.P.**

When Double Zinc C.S.P. is specified, the zinc coating mass (total on both sides) shall be not less than 1220 g/m<sup>2</sup> when tested by the triple spot test, or 1100 g/m<sup>2</sup> when tested by the single spot test.

**5.23.2.9 Polymer Coated C.S.P.**

When Polymer Coated C.S.P. is specified, the polymer coating shall be applied to both sides of the galvanized sheet prior to corrugating in accordance with classification grade 250/250 as specified in CSA G401 section 3.5.4.

Any pinholes, blisters, cracks or lack of bond shall be cause for rejection.

**5.23.3 INSPECTION, SAMPLING AND TESTING**

All materials shall be subject to inspection, sampling and quality assurance testing by the Consultant and the Contractor shall provide safe, convenient access, acceptable to the Consultant, for inspection and sampling of the materials, and shall co-operate in the inspection and sampling process when requested to do so.

The Contractor shall contact the Consultant at least 72 hours prior to shipping the materials to coordinate any inspection, sampling or testing at the manufacturing location and the delivery site that the Consultant deems necessary.

Any material found unacceptable by the Consultant shall be replaced with acceptable material by the Contractor at his expense.

5.23.4 MEASUREMENT AND PAYMENT

Payment for the supply of corrugated metal pipe and pipe arches including couplers and appurtenances will be included in the unit price bid per metre for "Culverts - Supply and Install" for the various types and sizes of culvert specified.