

PART 1 - GENERAL

1.1 Related Sections

- .1 Roadway Embankments - Section 31 24 13.
- .2 Riprap - Section 31 37 00
- .3 Granular Sub-base - Section 32 11 19
- .4 Granular Base - Section 32 11 23
- .5 Hot Mix Asphalt Concrete Paving - Section 32 12 16

1.2 References

- .1 American Society for Testing and Materials (ASTM).
- .2 ASTM C 14M-95, Standard Specification for Concrete Sewer, Storm Drain and Culvert Pipe.
- .3 ATM C 117-95, Standard Test Method for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
- .5 ASTM C 136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .6 ASTM C 144-97, Standard Specification for Aggregate for Masonry Mortar.
- .7 ASTM D 698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m3).
- .8 Canadian Standards Association (CSA)
- .9 Aluminum Structural Plate to AASHTO M219 and ASTM B746
- .10 Bolts to ASTM 307 and ASTM A 449

1.3 Samples

- .1 Submit samples in accordance with Section 01 33 00-Submittal Procedures.
- .2 Inform Departmental Representative at least 4 weeks prior to commencing work, of proposed source of bedding materials and provide access for sampling.

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| <u>1.4 Material Certification</u> | .1 | Submit manufacturer's test data and certification at least four weeks prior to commencing work. |
| | .2 | Certification to be marked on pipe. |
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<u>1.5 Delivery, Storage and Handling</u> |
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Contractor to deliver, store and handle materials in accordance with Product Requirements or TPW standards. |
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<u>1.6 Waste Management and Disposal</u> |
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Separate and recycle waste materials as indicated by Departmental Representative. |
| | .2 | Place materials defined as hazardous or toxic waste in designated containers. |
| | .3 | Ensure emptied containers are sealed and stored safely for disposal away from children. |

PART 2 - PRODUCTS

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| <u>2.1 Pipe</u> | .1 | Water-tight cut-off collars: as indicated. |
| | .2 | All pipe to be gasketed. |
| | .3 | CSP to Newfoundland Specifications, 2.8mm thickness, Aluminized Type II or double zinc coated. |
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<u>2.2 Granular Bedding and Backfill</u> |
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Granular bedding and backfill material to 31 05 17 - Aggregates: General and following requirements: |
| | .2 | Sub-base. |

PART 3 - EXECUTION

3.1 Trenching

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| .1 | Obtain Departmental Representative's approval of trench line and depth prior to placing bedding material or pipe. |
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3.2 Bedding

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| .1 | Dewater excavation, as necessary, to allow placement of culvert bedding in the dry. |
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- .2 Place minimum thickness of 200 mm of approved granular material on bottom of excavation and compact to minimum 100% maximum density to ASTM D 698.
- .3 Shape bedding to fit lower segment of pipe exterior so that width of at least 25% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by Departmental Representative, free from sags or high points.
- .4 Place bedding in unfrozen condition.

3.3 Laying Corrugated Steel Pipe Culverts

- .1 Commence pipe placing at downstream end.
- .2 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.
- .3 Lay pipe with outside circumferential laps facing upstream and longitudinal laps or seams at side or quarter points.
- .4 Do not allow water to flow through pipes during construction except as permitted by Departmental Representative.

3.4 Joints: Corrugated Steel Culverts

- .1 Corrugated steel pipe: joints/couplings shall be non-corroding, Steel Culverts aluminized Type II or double galvanized Zinc Coated to manufacturer's standards.
- .2 Match corrugations or indentations of coupler with pipe sections before tightening.
 - .1 Tap couplers firmly as they are being tightened, to take up slack and ensure snug fit.
 - .2 Insert and tighten bolts.

3.5 Backfilling

- .1 Place backfill material, approved by Departmental Representative, in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.
- .2 Compact each layer to 100% maximum density to ASTM D 698 taking special care to obtain required density under haunches.
- .3 Protect installed culvert with minimum 600 mm cover of compacted fill before heavy equipment is permitted to cross. During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 1:2.