**Water and Sewer**
**Storm Sewers and Culverts**
**Revised Date: 04/03/2018**

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## 08040 Storm Sewers and Culverts

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## 08040-1 Description of Work

This Specification covers the installation of corrugated steel, corrugated poly, reinforced concrete and PVC pipe culverts and riprap. The Contractor shall supply all labour, tools, equipment and materials for the construction of culverts through roadways and embankments, unless otherwise noted.

## 08040-2 Materials

The Contractor shall supply all culvert and storm sewer materials of the type and class approved by the City.

## 08040-3 Culvert Installation

The Contractor shall install culverts at locations noted on drawings and to the elevations staked by the Engineer. Culverts shall be placed in a trench and the bottom of trench shall be shaped to uniformly support the lower quadrant of the culvert pipe. Unsuitable foundation material shall be removed to the depth, width, and length authorized by the Engineer and replaced with suitable material.

## 08040-4 Bedding

All culverts installed under this Contract shall be laid on Class "B" granular bedding as shown on current City of Saskatoon Standard Drawings as posted on the City's Internet web site. Mechanical or pneumatic compaction equipment shall be used to compact bedding material around and up to the spring line of the pipe and for compacting the select backfill to 300 millimetres above the pipe. All bedding and backfill shall be compacted to 98% of Standard Proctor Density.

## 08040-5 Culvert Inlet and Outlet Treatment

Culvert inlet and outlet shall be constructed as per the Engineer's specifications. Riprap shall consist of durable field or quarry stone, hard, dense, resistant to weathering and to water action.

The riprap stones shall be 150 mm to 300 mm in diameter with stone sizes evenly distributed. The area to be riprapped shall be excavated and trimmed and 50 mm pipe bedding aggregate installed prior to placing the stones.

**08040-6**      **Measurement**

Culverts will be measured in metres.  Measurements will be taken parallel to the barrel for the entire length of the culvert.

Riprap will be measured in place, in cubic metres.

**08040-7**      **Payment**

Payment for installing corrugated steel, corrugated poly, reinforced concrete, and PVC pipe culverts or storm sewers will be at the contract unit price per metre for the sizes specified in the Tender Form.  The unit prices will be full compensation for supplying, unloading, storing, handling and hauling culvert materials, placing Class "B: bedding, excavating, assembling the culvert, backfilling and compacting the backfill material.  Payment for riprap will be at the contract unit price per cubic metre.  The unit price will be full compensation for excavating and preparing the bed, placing the 50 mm granular bedding, supplying, loading, hauling, unloading, and placing the stones.

Payment for removing unsuitable subgrade material, if directed by the Engineer will be paid for at the Contract Unit Price for unstable subgrade.  Unstable subgrade excavated from the bottom of the trench will be measured in cubic metres calculated from the length, width and depth authorized for removal.  The unit price shall include excavating and disposing of surplus material and backfilling with stabilized material.

Granular materials salvaged from existing roadways may be used as granular bedding and backfill material when installing culverts.  The Contractor will be responsible for handling and transporting the material from the stockpile site to the trench area.  The cost of handling granular backfill shall be included in the contract unit price for installing culverts.

**End of Specification 08040**