08020 Catch Basin Construction

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***Bold text denotes a change in this version (February 2023)**

08020-1 General Description of Work

The work to be done under this specification consists of providing all labour, plant, tools and equipment and supplying certain materials necessary for the construction of catch basins and leads and other related work, all in accordance with these specifications, the accompanying plans and all City Bylaws.

08020-2 Materials for Catch Basins, Riser Rings & Grade Rings

Materials used for catch basins shall be in accordance with the current ASTM Specification C478M-09, and as per drawings.

Rubber adjustment riser rings for 600 mm catch basin barrels shall be Infra-Riser or approved equal; have a 615mm I.D. and 806mm O.D.; and be flat type or a 25mm to 50mm taper. No rubber adjustment rings are required for 900 mm catch basin barrels.

Concrete grade rings shall be constructed using Type HS/HSb cement. Concrete compressive strength shall be 32MPa, with a minimum of 5 to 8 percent air entrainment. Reinforcement shall be 75 x 75 x 6.25mm wire, single layer on centre. Outside diameter shall be 800mm and inside diameter shall be 600mm with varying height for 600 mm catch basin barrels. For 900 mm catch basin barrels, refer to the standard drawings for dimensions.

The Contractor shall supply all poured in place concrete grout, pipe bedding materials, sealant for rubber adjustment riser rings and any other materials necessary to complete the work**.**

08020-3 Construction

3.1 Catch Basin Lead

All catch basin leads shall be connected to storm sewer manholes or other catch basin barrels. The connection of leads directly to the mains will not be permitted. Catch basin leads shall be laid in a straight line and at a constant and uniform grade of not less than 2%.

3.1.1 Excavation

The minimum width of trench below the crown of the pipe shall be 600mm. Upon excavation of the trench to the required depth, a layer of pipe bedding aggregate shall be placed and compacted to 98% of Standard Proctor Density to a minimum depth of 75mm. Any over-excavation by the Contractor below the required grade shall be backfilled at his expense with an approved compacted aggregate or gravel. Where leads are required to cross an area with unstable soil conditions, the Contractor shall over-excavate to a depth as directed by the Engineer. The over-excavated area shall then be filled with base gravel to the bottom of the pipe. The gravel will be paid for at the price tendered for base gravel in place.

3.1.2 Pipe Laying and Jointing

The Contractor shall establish and maintain line and grade control using a batterboard and boning rod system, laser beam system or other system approved by the Engineer.

The Contractor shall constantly check line and grade and in the event they do not meet that specified, the work shall be immediately stopped, the Engineer notified, and the cause remedied before proceeding with the work.

All pipe shall be installed with the spigots in a downgrade position. Bell holes shall be hand excavated at the end of each pipe for catch basin lead pipe with enlarged socket ends. An even bearing must be given to each pipe as it is installed and all adjustments for line and grade shall be made by hand shovel removal or filling in with compacted pipe bedding aggregate under the body of the pipe and not by wedging or blocking.

There shall be a maximum of two couplers allowed per single catch basin lead. All joints shall be made under the inspection of the Engineer with joints close and evenly abutting all around the pipes, special care being taken so that there will be no sagging of the spigot end in the hub, and that a true, even surface is given to the invert throughout the entire length of the sewer. The interior of the pipes and sockets must be cleared of earth, sand, stones, water and all foreign material before any jointing is done. The installation and jointing of the pipe shall be performed in a workmanlike manner in accordance with manufacturer's recommendations and accepted procedures for the particular material or product being used.

Pipe bedding aggregate shall be placed and mechanically compacted to 98% of Standard Proctor Density up to the spring line of the catch basin lead.

3.1.3 Backfill

Backfilling trenches before a thorough inspection by the Engineer or his representative will not be permitted.

The use of Fillcrete (Unshrinkable Fill – See Section 03001-3.2.10) is preferred when backfilling trenches. If Fillcrete is not used, the following methodology will be used for backfill:

Initial backfill in the pipe zone from the spring line of the pipe to 300mm above the crown of the pipe shall consist of select approved backfill hand placed and mechanically tamped to 98% of Standard Proctor Density. Approved excavated material shall then be placed in 150mm lifts over the whole width of the trench. Each lift shall be compacted to 98% of Standard Proctor Density using mechanical compaction equipment.

Granular backfill may be used in lieu of earth backfill. The granular material shall be placed and compacted in even layers to a minimum of 98% of Standard Proctor Density.

Periodical density tests will be performed by the City to make certain that the backfill is compacted to the specified density. Should the backfill not meet the specified density, the Contractor shall undertake to recompact the backfill. Another density test will be performed at the cost of the Contractor.

The cost of supplying, placing and compacting Fillcrete (Unshrinkable Fill – See Section 03001-3.2.10) or granular backfill shall be borne by the Contractor.

3.2 Roadway Subdrainage Pipe

All roadway subdrainage pipe shall be connected to catch basin barrels or T-connected to other subdrainage pipe (ie lane subdrain T-connected to road subdrain).

Subdrainage pipe shall be laid in a straight line matching the grade of the roadway structure it is installed under.

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3.2.1 Excavation

Excavation shall be performed as per the City of Saskatoon Standard Drawings for drainage layer or subdrain. Any unauthorized over-excavation shall be backfilled with approved compacted aggregate or gravel at the Contractor's expense.

3.2.2 Pipe Laying and Jointing

The contractor shall establish and maintain line and grade control using a batterboard and boning rod system, laser beam system or other system approved by the engineer.

3.3 Catch Basin Units & Storm Sewer Manhole Connections

Before installing precast catch basin barrels the area under the barrel shall be compacted to a minimum 98% of Standard Proctor density.

Precast concrete catch basin units shall be installed to grade on 75mm of crushed rock (25mm max. size) at the base. Manholes shall be cored and rubber gaskets used for lead installation. Debris resulting from the connection inside manholes shall be removed from the site. Manhole rungs are not to be removed or loosened in any way. If, however this does happen, the method of repair shall be determined by the Engineer and all costs borne by the Contractor.

All catch basin leads protruding into the manhole barrel shall be sloped according to the current City of Saskatoon Standard Drawing.

Roadway subdrainage pipe shall be connected to the catch basin barrel by coring and use of an approved rubber gasket. A 400mm long, 100mm diameter PVC pipe shall be used at the catch basin and connected to the perforated drainage pipe with an approved coupler.

3.4 Catch Basin Frame Adjustment

Catch basin barrels will be left 225mm low to accept grade rings below the catch basin frame.

The catch basin frame shall be installed such that it is entirely supported by adjustment rubber risers and concrete grade rings.

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Catch basin barrels may be left lower than 225mm to accept grade rings below the catch basin frame at the City Engineer's discretion if there is a conflict with existing or proposed utilities.

The minimum thickness of the concrete grade ring shall be 100mm and greater.

In most cases, for a 600 mm barrel catch basin, a 25mm **or 50mm** rubber adjustment riser may be placed between the catch basin barrel and 150mm concrete grade ring. Between the 150mm concrete grade ring and the catch basin frame, **one 25mm or one 50mm rubber adjustment ring may be placed.** For 900 mm barrel catch basins, concrete grade rings will be used to raise the catch basin frame and grate to the roadway elevation.

Rubber adjustment risers shall not be used for horizontal adjustments.

The rubber adjustment riser rings are to be bonded to the concrete barrel, other rubber adjustment riser rings, and a catch basin frame using a waterproof elastomeric polyurethane sealant. The sealant shall be applied in a continuous bead around the above-noted components approximately 25mm from the inner and outer edges. The sealant must be sufficiently placed between all grade rings (rubber and concrete) and frames so that when the components are placed together, the total areas touching are covered, and the sealant is squeezed out around the entire inner and outer circumference. A finished bead of sealant shall be placed on the inside and finished smoothly. The supply and application of the sealant shall be the Contractor's responsibility.

3.5 Existing Utilities

Prior to the installation of the catch basin unit and lead in the vicinity of existing underground utilities, the Contractor shall contact the Owner of the utility and undertake all precautions as directed. Any damage caused to the utility shall be repaired at the expense of the Contractor. If hand excavation is required to clear the utilities, such shall be carried out by the Contractor at no additional cost.

On curb returns, the catch basin unit shall be constructed after the straight section of the sidewalk or curb is completed. The catch basin frame shall be set to proper grade and alignment and the sidewalk or curb poured monolithically to the frame. In locations where the curb alignment is straight, the catch basin may be installed after the alignment and

grade of the curb or sidewalk has been staked for construction. Separate staking for catch basin construction will not be carried out.

Where an existing catch basin lead is not required, it shall be plugged by suitably concreting the lead at the manhole and at the catch basin barrel. If the catch basin barrel is not removed, it shall be backfilled with compacted granular material.

08020-4 Payment

4.1 Catch Basin

Catch basin will be paid for at the unit price tendered per catch basin unit **of each size and type**. No payment will be made for incomplete units.

4.2 Catch Basin Leads

Payment for catch basin leads will be at the price per lineal metre tendered **for each size** and based upon measured length from the outside edge of the catch basin grate to the nearest edge of the manhole rim.

This covers the complete work of installing the lead, including excavation to a maximum depth of 2.0 metres, pipe laying and jointing, sealing, and backfilling with Fillcrete (Unshrinkable Fill – See Section 03001-3.2.10) or backfilling with approved material to the specified density.

Where depth of trench excavation exceeds 2.0 metres, the cost of excavation in excess of 2.0 metres will be paid at the unit price for extra excavation.

4.3 Roadway Subdrainage Pipe

Payment for roadway subdrainage pipe will be on a price per lineal metre and based on a measurement from the outside edge of the catch basin grate to the end of the pipe.

This covers the complete work of installing the subdrainage pipe, laying and jointing and includes the PVC connection to the manhole.

4.4 Catch Basin Raise/Lower

Payment for raising and lowering existing catch basins will be paid at the unit price per vertical metre as measured by the Engineer. Payment will include all labour and material required, including bricks and mortar. No payment will be made for adjusting an existing catch basin horizontally if no vertical adjustment is required.

4.5 Exchange Frame and Cover

Payment for exchanging old catch basins or manhole frames and covers will be paid at the unit price which will include all labour and hauling to and from Central Stores.

4.6 Salvage Catch Basin

Payment for removing and salvaging existing catch basin units will include all labour and equipment including filling with Fillcrete (Unshrinkable Fill – See Section 03001-3.2.10) or backfilling with approved material and compacting the hole to 98% Standard Proctor and returning salvaged material to Central Stores. Unsalvageable material such as brick is classified as ordinary excavation and shall be removed from the site.

4.7 Fillcrete

Payment for Fillcrete (Unshrinkable Fill – See Section 03001-3.2.10) or compacted granular material, when required at a manhole or trench, will be made at the contract unit price per cubic metre and will include all labour and material required to place and compact to a minimum of 98% Standard Proctor Density.

4.8 Extra Trench Compaction

Payment for extra compaction of trench to increase from specified 98% to a minimum of 100% Standard Proctor Density will be made at the contract unit price and will include all labour, material and equipment required to obtain this additional compaction.

4.9 Blocking Existing Catch Basin Lead

Payment for blocking off existing catch basin leads will be made at the contract unit price for each lead blocked off, and will be full compensation for all labour and material required.

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End of Specification 08020

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