



**2.0 PRODUCTS**

**2.1 Materials**

- .1 Concrete to CSA A23.1-M90.
- .2 Precast manhole sections: shall be 1050 mm or 1200 mm diameter as indicated on the drawings to ASTM C478-75, circular. Top section eccentric cone with opening offset and vertical ladder installation.
  - .1 1050mm sections shall be supplied by Expconcrete.
  - .2 1200mm sections shall be supplied as designated by the Engineer.
- .3 Joints: to be made watertight using rubber rings, bituminous compound, epoxy resin cement or cement mortar.
- .4 Bituminous caulking compound: to CGBS-4a.
- .5 Mortar:
  - .1 Aggregate: to CSA A82.56-1950.
  - .2 Cement: to CSA A8-1970.
- .6 Ladder rungs: to be as detailed on the drawings.
- .7 Adjusting rings: to ASTM C478-75.
- .8 Brick: to CSA A82.1-1965 Type 1, Class B.
- .9 Drop manhole pipe: to be same as sewer.
- .10 Standard manhole frame and cover to be Titan Foundry Type TF-105 Herzog with no alternates.
- .11 Sewer stub pipes to the lengths and locations indicated on the drawings.

**3.0 EXECUTION**

**3.1 Excavation and Backfill**

- .1 Excavate and backfill to Section 02315.
- .2 Excavation requires approval prior to installing manholes.

**3.2 Concrete Work**

- .1 Do concrete work to CSA A23.1-M90.

MANHOLES

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**3.3 Installation**

- .1 Construct units to details indicated, plumb and true to alignment and grade.
- .2 Complete manholes as pipe laying progresses. Maximum of three manholes behind point of pipe laying will be allowed.
- .3 Pump manhole excavations dry and remove soft and foreign material before placing concrete base.
- .4 Cast bottom slabs directly on undisturbed ground or when permitted by Engineer, set precast concrete slab on 150 mm minimum of well compacted granular material.
- .5 For Precast Units:
  - .1 Set bottom section of precast unit in bed of mortar and bond to concrete slab. Make each successive joint watertight with approved rubber ring gaskets, mastic joint filler, cement mortar, or combination thereof.
  - .2 Clean surplus mortar and joint compounds from interior surface unit as work progresses.
  - .3 Plug lifting holes with precast concrete plugs set in cement mortar or mastic compound.
- .6 For Sanitary Sewers:
  - .1 Place stub outlets and bulkheads at elevations and in positions indicated.
  - .2 Bench to provide a smooth U-shaped channel. Side height of channel to be 0.75 times diameter of sewer. Adjacent floor to be sloped at 1 in 10. Channels to be curved smoothly. Slope invert to establish sewer grade. For pipes smaller than 250 mm use standard pipe, breaking out upper half of pipe upon completion of manhole.
- .7 Set frame and cover to required elevation using adjusting rings. Final adjustment to be at finished pavement.
- .8 Clean units of debris and foreign materials; remove fins or sharp protuberances.
- .9 Pre-benched manholes shall be watertight connections between pipe and manhole with pipe manufacturers rubber gaskets.
- .10 Manholes to be made watertight from the outside prior to backfilling.

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**MANHOLES**

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- .11 1200 mm  $\varnothing$  precast manholes shall have sanitary sewer pipe stubs cast into base during fabrication. Precast base shall be set on a bed of 150 mm well compacted crushed rock. Crushed rock shall be placed on undisturbed soil. If sewer pipe stubs are not cast into the precast base, coring a hole will be accepted using an approved coring machine. Using hammer's or any other method of providing a hole in the precast base will not be accepted.

**3.4 Delivery and Stockpiling Materials**

- .1 The Contractor shall be responsible for arranging, stockpiling, and protecting the materials from damage and theft.
- .2 The Contractor shall be responsible for the delivery of material and the Owner will not pay for materials ordered by the Contractor and not used in the work, nor pay for shipping charges on the return of such material to the supplier.

**3.5 Engineer's Access to the Work**

- .1 The Engineer shall be allowed to inspect the work at anytime.

**END OF SECTION**