G. Catch Basins Frames and Grates (Storm Sewer)

Catch basin frames and grates shall conform to the specific PennDOT type design indicated on the Contract Documents. All frames shall be cast iron. Concrete frames will not be accepted. Catch basin grates shall be cast iron and shall have the 45-degree grate pattern. All frames and grates shall conform to the Borough of Fox Chapel's standards.

All frame/cover interfacing surfaces shall be machined to preclude any "rocking."

Catch basin frames shall be secured by four 3/4-inch anchor bolts grouted into the top precast wall section of the catch basin.

If necessary, masonry or precast concrete adjustment rings shall be installed so that the cast iron inlet grate is installed flush with the pavement surface, with the surface alignment conforming to both the grade and crown of the traveled portion of the roadway pavement.

H. No Detectable Identification Tape (Storm Sewer)

Contrary to Section E-2, Part 2.3G, no detectable identification tape need be furnished for the storm sewer.

I. Visual Test Only (Storm Sewer)

Other than the visual test given in Section E-2, Part 6.1B, none of the field testing given in Section E-2, Part 6.1 of these Specifications shall apply to the storm sewer installation work.

J. Connection to Existing Storm Sewer (Storm Sewer)

The Utility Contractor shall connect the new storm sewer to the existing storm sewer at an existing catch basin. The hole in the existing catch basin which must be made to accommodate the new pipe entrance must be made carefully but need not be core drilled. The new pipe is to be cut smooth to be even with the inside face of the catch basin. The pipe/catch basin joint is to grouted.

17. STORM WATER DETENTION FACILITY

A. General (Storm Water Detention Facility)

The Utility Contract Work includes the furnishing and installation of an underground storm water detention facility. The facility is to be approximately 150 feet long, and is to made of precast reinforced concrete box culvert sections.

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B. Dimensions and Configuration (Storm Water Detention Facility)

The box culvert sections shall have an internal height of eight feet, and an internal width of six feet. The box culvert sections shall be manufactured so that the resulting detention facility shall be built to a radius as shown on the Contract Drawings. The detention facility shall be divided into two chambers separated by an outlet control wall. The detention portion of the facility (the larger portion) shall have an internal length of 140 feet. The outlet chamber shall have an internal length of five feet four inches.

The upstream end section of the detention facility shall be constructed to accommodate the entrance of a 15-inch diameter, Class V, reinforced concrete pipe so that the invert of the pipe shall be 4'-0" above the detention structure floor.

The downstream end section of the detention facility shall be constructed to accommodate the joining with a 15-inch diameter, Class V, reinforced concrete pipe so that the invert of the pipe is level with the floor of the detention facility. This requirement is necessary if all water is to be allowed to drain freely from the facility.

The precast box culvert sections need not be installed with gaskets or mortar. Other than the joints connecting the outlet control wall with the sides and floor of the box culvert, the storm water detention facility need not be a water tight structure.

C. Materials and Design (Storm Water Detention Facility)

The precast reinforced concrete box culvert materials and design shall conform to PennDOT Publication 408, Section 1085. The Design shall accommodate H-20 loading plus impact plus earth load. The depth of cover (at the deepest point) over the top of the stormwater detention facility is approximately thirteen (13) feet.

The concrete shall have a compressive strength of no less than 5,000 psi, shall have air entrainment of no less than five percent (5%), and shall contain Type 1A cement.

The outlet control wall shall be either precast reinforced concrete or shall be cast in place concrete. The design of the outlet control wall and the connection details between the outlet control wall and the sides and floor of the box culvert shall accommodate a hydrostatic head differential across the wall of eight (8) feet of water.

All materials and related appurtenances used to construct the detention facility shall be supplied by the box culvert manufacturer.

D. Outlet Control Wall (Storm Water Detention Facility)

The outlet control wall shall have two eight-inch square holes as shown on the Contract Drawings. Both holes shall be located midway between the side walls of the culvert. The lower and upper holes shall be cast into the wall at the elevations and dimensions shown on Drawing Number 1-22-1-86-15.

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Two galvanized steel orifice plates, fabricated to the dimensions indicated on Drawing Number 1-22-1-86-15, shall be installed on the upstream face of the outlet control wall.

All holes required for anchor bolts in the outlet control wall and the base of the detention facility shall have threaded nylon inserts.

The outlet wall shall be seven feet three inches in height, and shall have a level, smooth top surface. There shall be an open space of nine (9) inches between the top of the wall and the bottom of the box culvert ceiling.

E. Accesses (Storm Water Detention Facility)

The detention facility shall have three or four accesses, depending upon which Lump Sum Bid alternative is chosen for award.

Under both Lump Sum Bids, one access shall be a square, 48"x48" (internal measure in plan view) precast concrete access. The access hatch for that access shall be a 48" square (clear opening), single leaf aluminum sidewalk door, complete with locking arm (for locking in the open position), and designed for H-20 loading. The access door shall be manufactured by PA Insert Co., or equivalent.

For all manhole-type accesses, the bottom precast manhole wall sections shall sit atop and be entirely supported by the box culvert. Each manhole/access assembly shall conform to the storm sewer manhole requirements specified previously except that the manhole would have no bottom section and the top wall section shall be a flat top with a flat top cover designed to accommodate H-20 traffic loads.

Under Lump Sum Bid Number 1, one of the access manholes would have a standard frame and cover as was specified previously for the storm sewer. The other two access manholes shall have the standard frames but shall have grates instead of covers. The grates shall be cast iron, shall be machined, shall be suitable for use with the standard manhole frame specified and shall be designed to accommodate H-20 traffic loads. The Utility Contractor shall furnish two additional standard manhole covers, as was specified previously, and deliver them to the Authority's garage.

Under Lump Sum Bid Number 2, both access manholes shall have standard frames and covers as was specified previously for the storm sewer.

In lieu of the 48-inch inside diameter precast concrete access manholes, the Utility Contractor may furnish and install 48"x48" (internal measure in plan view) square precast concrete access riser sections over a 48"x48" square opening in the box culvert. If the Utility Contractor elects to use the square precast concrete riser sections, shop drawings for the riser sections, frames, covers and/or grates shall be submitted for review and acceptance by the Engineer prior to installation.

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F. Steps (Storm Water Detention Facility)

The Utility Contractor shall furnish manhole steps, either extruded aluminum or reinforced plastic, on the wall of the box culvert at the access locations. The circular manhole or square sections shall also have similar manhole steps.

G. Aluminum Ladder

At the large, 48"x48" square access, the stormwater detention structure shall have an aluminum ladder as indicated on Drawing Number 1-22-1-86-19, or as manufactured by PA Insert Co., or equivalent.

H. Pipe Screen (Storm Water Detention Facility)

A cast iron pipe screen shall be installed in conjunction with the lower orifice plate. The pipe screen shall be securely fastened to the detention facility with bolts and threaded nylon inserts.

The pipe screen shall be Model No. R-7512-B manufactured by Neenah Foundry.

I. Bedding (Storm Water Detention Facility)

The Utility Contractor shall furnish and install a compacted layer of No. 2A stone bedding under the storm water detention facility. The layer of stone bedding shall have a thickness of no less than four (4) inches.

J. Backfill (Storm Water Detention Facility)

The Utility Contractor shall furnish and install compacted No. 2A stone backfill around and above the facility.

K. Buoyancy

The Contractor shall furnish and install additional concrete backfill directly on the top of the storm water detention structure to the extent necessary to prevent flotation. It is not anticipated that much, if any, concrete backfill would be needed for this purpose. It would appear, however, that if the manufacturer of the precast units selects a very thin wall section for the detention structure, some concrete backfill may be needed above a portion of the western end of the structure to prevent flotation.

The Contractor shall submit data regarding the weight of detention structure components to the Engineer. Should concrete backfill be necessary, the Utility Contractor shall provide such backfill as part of the Utility Contract Work and at no additional expense to the Authority.

During installation of the detention structure, the Utility Contractor is cautioned to take measures to assure that ground water may freely enter into the structure, at least until backfill occurs to a level at least four feet above the surface of the top of the structure.

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