

FOR CLIENT REVIEW May 20, 2009

SECTION 334100 - STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes storm drainage piping, structures and related components outside the buildings:
 - 1. Pipe and fittings.
 - 2. Manholes.
 - 3. Catch basins.
- B. Related Sections:
 - 1. Division 31 Section "Earth Moving" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.
 - 2. Division 33 Section "Utility Storm Water Treatment" for hydrodynamic separators.

1.3 DEFINITIONS

- A. CPP: Corrugated high-density polyethylene pipe.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
 - 1. Manholes: Include plans, elevations, sections, details, frames, and covers.
 - 2. Catch basins: Include plans, elevations, sections, details, frames, covers, and grates.
- C. Product Certificates: For each type of pipe and fitting, from manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect pipe, pipe fittings, and seals from dirt and damage.

TRUESDALE LAKE SITE #3
South Salem, NY

- B. Handle manholes according to manufacturer's written rigging instructions.
- C. Handle catch basins according to manufacturer's written rigging instructions.
- D. Delivery and storage: Concrete catch basin and manholes shall not be shipped for use until at least 5 days old and concrete has attained 3,000 p.s.i.

1.6 PROJECT CONDITIONS

- A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
 - 1. Notify Engineer no fewer than 5 days in advance of proposed interruption of service.
 - 2. Do not proceed with interruption of service without Engineer's written permission.

1.7 QUALITY ASSURANCE

- A. Materials and workmanship shall conform to the New York Department of Transportation Standard Specifications as well as the following general specifications:
 - 1. American Society for Testing and Materials (ASTM).
 - 2. American Association of State Highway and Transportation Officials (AASHTO).

PART 2 - PRODUCTS

2.1 CORRUGATED POLYETHYLENE PIPE AND FITTINGS

- A. Corrugated Polyethylene Pipe (CPP) and Fittings 8-60" ID:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advanced Drainage Systems, 4640 Trueman Boulevard, Hilliard, OH 43026.
 - b. Hancor, Inc., 401 Olive Street, Findlay, Ohio 45840.
 - 2. Pipe: AASHTO M 294M, heavy duty corrugated polyethylene pipe Type S, with smooth waterway for coupling joints.
 - 3. Soiltight Couplings: AASHTO M 294M, corrugated, matching pipe and fittings.

2.2 PRECAST CONCRETE STORM DRAINAGE MANHOLES

- A. Precast concrete manholes, including ductile iron frames and covers, shall conform to New York Department of Transportation Standard Specifications, Section 604. For manhole covers, include indented top design with lettering cast into cover, using wording equivalent to "STORM SEWER."

2.3 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350/350R, and the following:
 - 1. Cement: ASTM C 150, Type II.
 - 2. Fine Aggregate: ASTM C 33, sand.
 - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 - 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
 - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
 - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.
- C. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
 - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
 - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

2.4 CATCH BASINS

- A. Precast concrete catch basins, including frames and grates, shall conform to New York Department of Transportation Standard Specifications, Section 604.

PART 3 - EXECUTION

3.1 GENERAL

- A. Conform to the applicable sections of these Specifications and New York Department of Transportation Standard Specifications for execution of all drainage work.

3.2 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

3.3 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves,

and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

- C. Install manholes for changes in direction unless fittings are indicated.
- D. Install proper size increasers, reducers, adapters, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

3.4 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure drainage piping according to ASTM D 3212 for push-on joints.

3.5 MANHOLE INSTALLATION

- A. General: Furnish and install manholes, complete with appurtenances and accessories indicated to the lines, grades, and dimensions detailed on the Drawings and as specified herein. Comply with New York Department of Transportation Standard Specifications Section 604.
- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Extend inlet and outlet pipes through the walls for a sufficient distance beyond the outside surface to allow for satisfactory connections, and construct the concrete or masonry around them neatly to prevent leakage along their outer surfaces. Cut the pipe flush with the inside face of the wall, or as shown on the plans.
- D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere unless otherwise indicated.

3.6 CATCH BASIN INSTALLATION

- A. General: Furnish and install catch basins complete with appurtenances and accessories indicated to the lines, grades, and dimensions detailed on the Drawings and as specified herein. Comply with New York Department of Transportation Standard Specifications Section 604.
- B. Install precast concrete catch basin sections with sealants according to ASTM C 891.
- C. Extend inlet and outlet pipes through the walls for a sufficient distance beyond the outside surface to allow for satisfactory connections, and construct the concrete or masonry around them neatly to prevent leakage along their outer surfaces. Cut the pipe flush with the inside face of the wall, or as shown on the plans.
- D. Set frames and grates of the sizes and types indicated to elevations shown on the drawings.
- E. Give the surfaces of the tops of all catch basins a coat of protective compound material upon completion of the concrete curing period at the rate of .04 gallons per square yard (0.2 liter per square meter).

3.7 CONNECTIONS

- A. Make connections to existing catch basins and manholes.
 - 1. Make connections to existing catch basins and manholes by cutting into existing unit and creating an opening large enough to allow 3 inches of concrete or non-shrink grout to be packed around entering connection. Cut end of connection pipe passing through structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of manhole or catch basin wall, encase entering connection in 6 inches of concrete or non-shrink grout for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
 - a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
 - b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
 - 2. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making connections. Remove debris or other extraneous material that may accumulate.

3.8 CLEANING

- A. Clean interior of piping of dirt and superfluous materials. Flush with water.
- B. Notify Engineer in writing when this work is complete, for a final inspection and acceptance by the Owner.

END OF SECTION 334100