SECTION 33 4116
SITE STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Perform excavating and backfilling required for work of this Section.
   2. Furnish and install storm drainage system as described in Contract Documents from point of water collection to terminating point.

B. Related Sections:
   1. Section 31 2316: Procedure and quality of excavating.
   2. Section 31 2323: Procedure and quality of backfilling and compacting.

1.2 REFERENCES

A. American Association Of State Highway And Transportation Officials:
   1. AASHTO M-252, 4 to 10 inch 100 to 250 mm pipe, 'Specifications for Corrugated Polyethylene Pipe.'
   2. AASHTO M-294, 12 to 48 inch 300 to 1200 mm pipe, 'Specifications for Corrugated Polyethylene Pipe.'

B. American Society For Testing And Materials:
   1. ASTM A 74-03b, 'Standard Specification for Cast Iron Soil Pipe and Fittings.'
   2. ASTM A 536-84 (99), 'Standard Specification for Ductile Iron Castings.'
   3. ASTM A 929-01, 'Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe.'
   4. ASTM C 14-03, 'Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.'
   5. ASTM C 76-03, 'Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.'
   7. ASTM D 2321-00, 'Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.'
   8. ASTM D 3034-00, 'Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.'
   10. ASTM F 794-03, 'Standard Specification for Poly(Vinyl Chloride)(PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.'
   11. ASTM F 1336-02, 'Standard Specification for Poly(Vinyl Chloride)(PVC) Gasketed Sewer Fittings.'

PART 2 - PRODUCTS

2.1 MATERIAL

A. Bedding Material: 3/8 inch 10 mm crushed gravel.
2.2 COMPONENTS

A. Catch Basins, Curb Inlets, Etc:
   1. Concrete:
      a. Construct of 4000 psi minimum concrete.
      b. Include cover inlet with cast iron frame and grate as shown on Drawings.
   2. PVC:
      a. Comply with requirements of ASTM D 3212, ASTM F 794, and ASTM F 1336.
      b. Metal grates, Frames, and hoods shall comply with ASTM A 536, Grade 70-50-05.
      c. Type One Acceptable Products:
         2) Equal as approved by Architect before bidding. See Section 01 6000.

B. Concrete Pipe:
   2. Reinforced:
      a. Meet requirements of ASTM C 76, plain end.
      b. Determine class of pipe by depth of cover over pipe at rough-graded elevations as follows:
         1) Depth Of Cover          Class Of Pipe
            a) Under 2 feet  600 mm   V
            b) 2 feet to 3 feet  600 to 900 mm  IV
            c) 3 feet to 6 feet  900 to 1 800 mm  III
            d) Over 6 feet  1 800 mm    II

C. PVC Pipe And Fittings:
   1. Meet requirements of ASTM D 3034, SDR 35.
   2. Fittings: Slip Joint type with elastomeric seals.

D. Corrugated Polyethylene Pipe And Fittings:
   1. Meet requirements of AASHTO M-252 or M-294, Type S.
      a. Corrugated, helical or annular, exterior with smooth interior and gasketed connectors.
      b. Corrugated, annular, with silt and watertight joints for storm sewers.

E. Corrugated Metal Pipe:
   1. Meet requirements of ASTM A 929.
   2. 16 gauge, standard round, galvanized with 2 ounces zinc per square foot sheet steel.
   3. Corrugations:
      a. 6 to 10 Inch 150 to 250 mm Pipe: 1-1/2 by 1/4 inch 38 by 6 mm depth helical corrugations.
      b. 12 to 60 Inch 300 to 1 500 mm Pipe: 2-2/3 by 1/2 inch 58 by 12.5 mm depth helical corrugations.

F. Cast Iron Soil Pipe And Fittings:
   1. Meet requirements of ASTM A 74.
   2. Joint Material: Rubber gaskets meeting requirements of ASTM C 564 and compatible with pipe used.

PART 3 - EXECUTION

3.1 PREPARATION

A. Excavate and backfill as specified in Section 31 2316 and 31 2323 with following additional requirements:
   1. Runs shall be as close as possible to those shown on Drawings.
   2. Excavate to required depth.
   3. Grade to obtain fall required.
   4. Remove debris from trench before laying bedding and pipe.
   5. Do not cut trenches near footings without consulting Architect.
6. Backfill only after pipe lines have been tested, inspected, and approved by Architect.

3.2 INSTALLATION

A. Concrete Pipe:
   1. Provide 3 inches 75 mm of uncompacted bedding material below pipe.
   2. After installation of pipe, provide additional bedding material up to springline of pipe.

B. PVC / Polyethylene Pipe:
   1. Install in accordance with ASTM D 2321.
   2. Minimum cover for corrugated polyethylene pipe and fittings shall be 12 inches 300 mm for H-20 load.

C. Use jacks to make-up gasketed joints.

3.3 FIELD QUALITY CONTROL

A. Failure to install joints properly shall be cause for rejection and replacement of piping system.

3.4 CLEANING

A. Remove excess earth from site or place as directed by Architect.

END OF SECTION