CITY OF FORT WAYNE MASTER UPDATED: 1/5/15

SECTION

PVC NON-PRESSURE UTILITY PIPING

NTS: This section covers non-pressurized PVC pipe. PVC pipe covered in this section includes buried PVC non-pressure pipe with bell and spigot joints for sanitary and storm applications. PVC pipe in this section is installed using open excavation.

Not covered in this section is pressure PVC utility piping. Other types of non-metallic piping, such as HDPE, are in other specification sections. Edit this section to suit project requirements. Coordinate this section with applicable requirements of Division 33 installation. Installation and jointing methods are included in the applicable piping installation section. Trenching and backfill information is in 33 00 05 Trenching and Earthwork.

1. GENERAL
   1. DESCRIPTION
      1. Scope:
         1. Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install PVC pipe and fittings as shown and specified.
      2. Coordination:
         1. Review installation procedures under this and other applicable sections and coordinate installation of items to be installed with, or before the PVC utility pipe Work.
      3. Related Sections:

NTS: List below only sections covering products, construction, and equipment specifically identified in this section and specified in another section and directly referenced in this specification. Do not list administrative and procedural Division 01 sections. Insert at (--1--) the number and name of the Division 33 installation section or any other referenced sections.

* + - 1. Section 31 00 05, Trenching and Earthwork.
      2. Section (--1--).

NTS: Section “1.2” is to be included if project is bid on unit price basis. Section to be deleted or revised if project is to be bid on lump sum basis.

NTS: Insert at (--1--), (--2--) and (--3--) below the various PVC non-pressure pipe types and diameters to be used for project. Adjust Section “1.2” below for additional work item numbers as needed. In extreme cases consider separating the work items by diameter and depth.

Review Paragraph “A.4”: below and modify to suit the project.

* 1. MEASUREMENT AND PAYMENT
     1. PVC Non-Pressure Utility Piping
        1. Work Item Number and Title

**33 05 37.13-A (--1--) PVC Non-Pressure Utility Piping**

**33 05 37.13-B (--2--) PVC Non-Pressure Utility Piping**

**33 05 37.13-C (--3--) PVC Non-Pressure Utility Piping**

* + - 1. The quantity of pipe installed shall be the number of linear feet actually installed, backfilled, and tested, as measured from outside wall of structure to outside wall of structure, as measured along the centerline of the pipe.
      2. The payment of pipe shall be based on the unit price per linear foot as listed on the submitted Bid schedule for each size successfully installed. Payment for any associated restoration shall be paid for under its respective Work item.
      3. These Work items shall include all costs to furnish all labor, materials, tools, and equipment, both permanent and temporary, to install the PVC non-pressure pipe as shown and specified. The Work includes, but is not limited to, trench excavation, dewatering, furnishing and placement of bedding, pipe, placement of required backfill, disposing of excess excavated material, required fittings, testing of materials, compaction of bedding and backfill, temporary sheeting, shoring and bracing, restoration/replacement of all disturbed items not included under other Work items, protection of existing utilities and structures, testing and incidentals for performing all Work as specified unless otherwise provided for as a separate Work item.
  1. REFERENCES

NTS: Retain applicable standards and add/delete as required.

* + 1. Standards referenced in this Section are listed below:
       1. American Association of State Highway and Transportation Officials.
          1. AASHTO Standard Specifications.
       2. ASTM International.
          1. ASTM D1784, Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
          2. ASTM D1785, Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.
          3. ASTM D2466, Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
          4. ASTM D2467, Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
          5. ASTM D2564, Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
          6. ASTM D3034, Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
          7. ASTM D3212, Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
          8. ASTM F477, Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
          9. ASTM F656, Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
          10. ASTM F679, Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
          11. ASTM F949, Standard Specification for Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings.
          12. ASTM F1760, Specification for Coextruded Poly (Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed-Recycled Content.
  1. QUALITY ASSURANCE

NTS: Edit or delete Paragraph “A” below if project requirements prohibit an experience clause.

* + 1. Manufacturer’s Qualifications:
       1. Manufacturer: Shall have a minimum of 5 years’ experience producing PVC pipe and fittings and shall be able to submit documentation of satisfactory service in at least 5 completed installations in operation for at least 5 years each.
    2. Component Supply and Compatibility:
       1. All pipe of each material type shall be furnished by the same manufacturer.
       2. PVC pipe Supplier shall prepare, review, all Shop Drawings and other submittals for all materials furnished under this section.
       3. Materials shall be suitable for specified service conditions and shall be integrated into overall assembly by PVC pipe Supplier.
  1. SUBMITTALS

NTS: Review Paragraph “A” and “B” below and modify or eliminate to suit the project. Piping layout should only be requested for special circumstances such as areas where pipe restraint is required.

* + 1. Action Submittals: Submit the following:
       1. Product Data:
          1. Submit product data on pipe, fittings, gaskets, hardware, pipe gasket lubricant and appurtenances sufficient to demonstrate compliance with the Contract Documents.
    2. Informational Submittals: Submit the following:
       1. Certificates:
          1. Submit manufacturer’s certificate of compliance standards referenced in this Section.
       2. Source Quality Control Submittals:
          1. When requested by Engineer, submit results of source quality control tests. Ensure the quality control tests were completed on the same material installed.

NTS: Edit or delete Paragraph “3” below if project requirements prohibit an experience clause.

* + - 1. Qualifications Statements:
         1. Submit qualifications of manufacturer when requested by Engineer.
         2. Submit qualifications of installer when requested by Engineer.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Ship and store in accordance with manufacture’s recommendations.
     2. Inspect all materials during unloading process.
     3. Notify Owner of any cracked, flawed or otherwise defective material.
     4. Remove all materials from the Site that are found to be unsatisfactory.
     5. Comply with Section 01 65 00 Product Delivery Requirements and Section 01 66 00 Product Storage and Handling Requirements.

1. products
   1. MATERIALS

NTS: Edit Paragraph “A” to suit the project.

* + 1. General:
       1. Pipe materials shall be suitable for services intended.
       2. Pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, and other defects. Unless otherwise shown or indicated, pipe shall be uniform in color, opacity, density, and other physical properties.
       3. Buried pipe shall be capable of withstanding external live load, including impact, equal to AASHTO H-20 loading, with cover shown or indicated in the Contract Documents.
    2. POLYVINYL CHLORIDE (PVC) PIPING

NTS: Paragraphs “A”, “B” and “C” covers PVC pipe typically used in buried gravity sewer applications, such as sanitary sewers and storm sewers. Edit to suit the project. Delete if not required.

NTS: Insert at (--1--) and (--2--) the structural pipe requirements either SDR 35 (46 psi), SDR 26 (115 psi), or SDR 21 (200 psi). If it is desired to require PVC pipe with recycled content, require compliance with ASTM F1760.

* + - 1. Buried PVC Gravity Sewer Pipe (Diameter < 18 inch).
         1. Material (--1--):

Pipe shall comply with ASTM D3034.

Wall Thickness and Pipe Stiffness: Pipe stiffness shall be determined in accordance with test methods in ASTM D3034.

Main Line: (--1--), with minimum ring stiffness of (--2--) psi.

Service Laterals: (--1--), with minimum ring stiffness of (--2--) psi.

* + - * 1. Fittings:

Gasketed fittings shall comply with ASTM D3034 .

Unless otherwise shown or indicated, saddle wyes are unacceptable.

* + - * 1. Joints:

Provide bell and spigot joints. Bell shall consist of an integral wall section to hold securely in place (and prevent displacement during assembly of joint) elastomeric O-ring gasket.

Jointing lubricant shall be as recommended by pipe manufacturer.

Provide elastomeric gaskets complying with ASTM F477 and ASTM D3212.

NTS: Insert at (--1--) and (--2--) the structural pipe requirements. For sanitary sewers a minimum pipe stiffness of 46 psi is required.

* + - 1. Buried PVC Gravity Sewer Pipe (Diameter 18 inch to 48 inch).
         1. Material(--1--):

Pipe shall comply with ASTM F679.

Wall Thickness and Pipe Stiffness: Pipe stiffness shall be determined in accordance with test methods in ASTM F679.

Main Line: (--1--), with minimum ring stiffness of (--2--) psi.

* + - * 1. Fittings:

Gasketed fittings shall comply with ASTM F679.

Unless otherwise shown or indicated, saddle wyes are unacceptable.

* + - * 1. Joints:

Provide bell and spigot joints. Bell shall consist of an integral wall section to hold securely in place (and prevent displacement during assembly of joint) elastomeric O-ring gasket.

Jointing lubricant shall be as recommended by pipe manufacturer.

Provide elastomeric gaskets complying with ASTM F477 and ASTM D3212.

NTS: Insert at (--1--) the required pipe wall thickness, either Schedule “40” or Schedule “80”. Schedule “40” or “80” typically is for use within 5’ of a building.

* + - 1. Buried PVC Gravity Sewer Pipe (Within 5 feet of Building)
         1. Material (--1--):

Pipe shall comply with ASTM D1785.

Wall Thickness: Schedule (--1--) complying with ASTM D1785

* + - * 1. Fittings: Type, grade, schedule, and color of fitting shall match the associated pipe.

NTS: Most fittings carry a pressure rating different from the pipe. Contact the pipe manufacturers to verify that fittings’ pressure rating is at least equal to that of the associated pipe. Insert at (--1--), “ASTM D2466” for Schedule 40, or, “ASTM D2467” for Schedule 80.

Solvent Weld: Comply with (--1--).

* + - * 1. Joints:

Solvent Weld: Use primer and solvent cement recommended by PVC pipe manufacturer for the application. Primer shall be in accordance with ASTM F656, and solvent cement shall be in accordance with ASTM D2564.

NTS: Insert at (--1--) and (--2--) the structural pipe requirements. The following material is intended for storm sewer applications. Remove if not applicable to project. Add in additional project requirements as necessary. This profile wall pipe consists of an outer corrugated wall fused to a smooth inner wall providing pipe stiffness levels of 46 psi and 115 psi.

* + - 1. Buried Profile Wall PVC Gravity Sewer Pipe (Diameter 12 inch to 36 inch).
         1. Material(--1--):

Pipe shall comply with ASTM F949.

Wall Thickness and Pipe Stiffness: Pipe stiffness shall be determined in accordance with test methods in ASTM F949.

Main Line: (--1--), with minimum ring stiffness of (--2--) psi.

* + - * 1. Fittings:

Gasketed fittings shall comply with ASTM F949 or ASTM F794.

* + - * 1. Joints:

Provide bell and spigot joints. Bell shall consist of an integral wall section to hold securely in place (and prevent displacement during assembly of joint) elastomeric O-ring gasket.

Jointing lubricant shall be as recommended by pipe manufacturer.

Provide elastomeric gaskets complying with ASTM F477.

* 1. MARKING FOR IDENTIFICATION

NTS: Delete Paragraph “A” if there is no laying schedule on the project.

* + 1. Factory-mark each length of pipe and each fitting with designation conforming to those on approved laying schedules.
    2. Manufacturer shall cast or paint on each length of pipe and each fitting pipe material, diameter, and pressure or thickness class.
  1. SOURCE QUALITY CONTROL
     1. Shop Tests:
        1. Pipe manufacturer shall maintain continuous quality control program.
        2. Where applicable and when requested by Engineer, submit results of source quality control tests specified in reference standards.

1. EXECUTION
   1. INSPECTION
      1. Inspect pipe materials for defects in material and workmanship. Verify compatibility of pipe and fittings.
   2. INSTALLATION
      1. Buried Piping Installation
         1. Refer to the applicable Division 33 piping installation section.
      2. Bedding and Backfill
         1. Refer to Section 31 00 05 Trenching and Earthwork.

NTS: Specifier to consider known construction sequencing and procedures when determining pipe design. Heavy construction loading should be avoided for installed pipes with shallow cover.

* + 1. Contractor shall be responsible for verification of pipe loading during construction. Pipe design is based on final installation depth and required cover.

NTS: Coordinate article “3.4” below with project specific testing requirements listed within the appropriate installation Section. Insert at (--1--) below either, 33 11 00, Water Piping Installation, 33 31 00, Sanitary Sewer Piping Installation, and/or 33 41 00, Storm Utility Piping Installation.

* 1. FIELD QUALITY CONTROL
     1. Complete pipe testing requirements in accordance with Section (--1--).

+ + END OF SECTION + +