Section 15064

POLYVINYL CHLORIDE PIPE LESS THAN 4" IN DIAMETER

PART 1 GENERAL

1.01 SUMMARY

This Section includes furnishing all labor, materials, equipment, supplies, supervision, and tools for furnishing, installation, and testing of Polyvinyl Chloride (PVC) piping for drain, waste, and vent (DWV) and pressure systems less than 4" in diameter, or parts thereof.

1.02 MEASUREMENT AND PAYMENT

No separate payment for Work performed under this Section. Include cost of same in Contract price bid for Work of which this is a component part.

1.03 REFERENCES

This specification references the following publications in their current editions. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

A. ASTM D1784: Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

B. ASTM D1785: Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

C. ASTM D2467: Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

D. ASTM D2564: Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems

E. NSF/ANSI 61: Drinking Water System Components – Health Effects

1.04 SUBMITTALS

Submit the following in accordance with Section 01330 – "Submittal Procedures:"

A. Manufacturer’s literature describing fabrication dimensions

B. Manufacturer’s installation instructions

1.05 RELATED REQUIREMENTS

The following related requirements are as applicable and as indicated as part of these Contract Specifications.

A. Section 01330 - "Submittal Procedures"

B. Section 02514 - "Disinfection of Water Lines"

C. Section 02515 - "Hydrostatic Testing of Pipelines"

D. Other Sections that cover underground installation.

E. The piping and fittings specified herein shall meet and/or exceed the industry standards and requirements as set forth by the American Society for Testing and Materials (ASTM) and the National Sanitation Foundation (NSF). The piping and fittings shall carry the NSF seal of approval for potable water applications, from an organization accredited by ANSI.

1.06 – 1.13 (NOT USED)

PART 2 PRODUCTS

2.01 MANUFACTURER(S)

A. Thread Lubricant, Tape

1. Dupont,

2. Or Approved Equal

2.02 MATERIALS AND/OR EQUIPMENT

A. PVC Pipe

1. Provide Schedule 80 pipe with Schedule 80 fittings and appurtenances to locations shown on Drawings for pressure systems, and provide Schedule 40 pipe with Schedule 40 fittings and appurtenances to locations shown on Drawings for DWV systems.

2. Furnish materials in full compliance to following material specifications:

a. Manufacture pipe, fittings and appurtenances from polyvinyl chloride (PVC) compound which meets the requirements of Type 1, Grade 1 (12454-B) Polyvinyl Chloride as outlined in ASTM D1784.

b. Manufacture pipe, fittings and valves to be used in contact with potable water from materials that have been tested and approved for conveying potable water by the NSF/ANSI 61.

3. Pipe:

   a. Furnish pipe meeting requirements of ASTM D1785

   b. Pipe to be solvent welded

4. Fittings and Unions:

   a. For pressure systems provide socket type fittings according to ASTM D2467 having the same pressure and temperature rating as the pipe.

   b. For DWV systems provide socket type fittings according to ASTM D1785

   c. Furnish unions at locations shown on Drawings

   d. Provide unions at valves, penetrations through structures and equipment connections

   e. Provide socket type PVC union with Buna O-rings

5. Expansion Joints:

   a. CPVC (½-inch through 4-inch) piston-type joints with Teflon-impregnated seal rings for service other than chlorine solution

   b. Refer to Drawings for joints for chlorine service

6. Joint Solvent:

   a. Use fast-drying solvent for 1 ½-inch sizes and smaller

   b. Use heavy slow-drying type for 2-inch and larger sizes

   c. Solvent shall meet ASTM D2564 and NSF/ANSI 61 standards

7. Thread Lubricant, Liquid:

   a. Teflon base liquid in plastic squeeze bottles

   b. Use liquid lubricant on permanent joints and all instrument air lines

8. Thread Lubricant, Tape:

    a. Teflon base tape as manufactured by DuPont, or approved equal

    b. Use tape on all joints for valves or joints that may be disconnected often, except instrument air lines.

B. Valves

1. Ball Valves:

    a. Chemtrol True Union (TU) Series

    b. Georg Fischer (GF) Type 546

    c. Class 12454-B PVC body per ASTM D1784

    d. Or approved equal

2. Check Valves:

    a. Chemtrol True Union Ball Check (TUBC) Series

    b. Georg Fischer (GF) Type 360, Class 12454-B PVC body per ASTM D1784

    c. Or approved equal

3. Diaphragm Valves:

    Rigid unplasticized PVC body with Teflon diaphragms for chloride service or Neoprene diaphragms in other service unless otherwise designated on Drawings

C. PVC Tubing

1. Provide flexible PVC tubing with fittings and appurtenances as shown on Drawings.

2. Materials:

    a. Furnish clear braided tubing

    b. Have tubing manufactured of nylon with working temperatures from 5 to 140ºF

    c. Design tubing with a minimum safety factor of 3 to 1 ratio of burst pressure to working pressure at maximum temperature

d. Provide tubing with minimum working pressure of 100 psi at 70ºF

e. NSF/ANSI 61 approved

f. Ensure that tubing is self-extinguishing and fire resistant

3. Fittings:

a. Install tubing with nylon fittings and connectors

b. Use barbed type adapters with stainless steel clamps

c. Provide fittings capable of withstanding temperatures from a -70ºF to 250ºF

d. Ensure fittings have the same pressure and temperature rating as the tubing

2.03-2.04 (NOT USED)

PART 3 EXECUTION

3.01-3.02 (NOT USED)

3.03 INSTALLATION AND CONSTRUCTION

A. PVC Pipe

1. Perform installation procedures, handling, connections, solvent welding, and other appurtenant operations in full compliance to the manufacturer's printed recommendations and in full observance to Drawing details when more stringent.

2. Cut and fit pipe accurately to measurements established at the site. Use only methods of cutting, welding, and threading as recommended in instruction manuals published by the manufacturer of the materials being used. Use only strap wrenches for tightening threaded joints.

3. Provide unions to permit removal of all valves, equipment, and any section of pipe without cutting the installed pipe.

4. Provide expansion joints for temperature variations exceeding 30°F or with straight runs longer than 50 feet.

5. Provide valved vent connections at high point and drain connections at low point of each section of the system such that all fluid or air may be removed from the piping.

6. Do not spring or force pipe in space.

B. Hangers and Supports

1. Use only commercial metallic hangers and supports, except for hangers and supports detailed on the Drawings. All hangers to be galvanized unless otherwise designated on Drawings.

2. Pitch all horizontal runs of piping to drain.

3. Use spring hangers on vertical runs of piping when necessary to provide for expansion.

4. Use roller and sliding, guided supports on horizontal runs of piping when necessary to provide for expansion.

5. Anchor and brace pipe at expansion joints to force expansion and contraction within joint without buckling. Follow manufacturer's published instructions.

6. Continuously support pipe operating at liquid temperatures in excess of 100ºF

7. Minimum span to be shown on the Drawings or as recommended in the published manuals of the pipe manufacturer for the sizes and weights being used. Use 90°F for inside piping and 110°F for outside piping when selecting span dimensions. Span to be the shortest required or recommended in any case of conflict between Drawings and published data

3.04 REPAIR/RESTORATION (NOT USED)

3.05 FIELD QUALITY CONTROL

A. General

1. All piping systems are to be tested

2. All equipment, gauges, pumps, and leak detectors to be provided by Contractor

3. All tests to be witnessed and approved by the Project Manager and/or Engineer

4. Test duration shall be per Section 02515 – "Hydrostatic Testing of Pipelines."

5. Disinfection of the lines shall be per Section 02514 – "Disinfection of Water Lines."

B. Liquid Systems

1. Test liquid systems per 02514 – "Hydrostatic Testing of Pipelines"

2. Determine location of leaks with an approved detector or with soap suds

3. If leaks are evident, repair same and repeat tests until approved

C. Gas or Air Systems

1. Apply pneumatic test pressure at 150 percent of system working pressure, but not less than 50 psi

2. Test pressure shall hold with no pressure drop

3. Determine location of leaks with an approved detector or with soap suds

4. If leaks are evident, repair same and repeat tests until approved.

3.06-3.10 (NOT USED)

END OF SECTION