SECTION 22 66 00 - LABORATORY AND HEALTHCARE CHEMICAL-WASTE SYSTEMS

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 piping and specialties for chemical-waste and vent, gravity-flow, nonpressure piping system designated “acid resistant waste” (ARW) and “acid resistant vent” (ARV).

1.3 DEFINITIONS

A. PP: Polypropylene.

1.4 PERFORMANCE REQUIREMENTS

A. Single-Wall Piping Pressure Rating: 10 feet head of water.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from sewerage system piping. Indicate interface and spatial relationship between piping and proximate structures.

C. Field quality-control test reports.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain pipe, fittings, and joining materials for each piping system through one source from a single manufacturer.

1. Exception: Piping from different manufacturers may be used in same system if indicated and suitable transition fittings matching both piping materials are used.

B. Product Options: Drawings indicate size, profiles, and dimensional requirements of chemical-waste specialties and are based on the specific system indicated. Refer to Division 1 Section "Product Requirements."

C. Piping materials shall bear label, stamp, or other markings of specified testing laboratory.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store piping and specialties with sealing plugs in ends or with end protection.

B. Do not store plastic pipe or fittings in direct sunlight.

C. Protect pipe, fittings, and seals from dirt and damage.

PART 2 - PRODUCTS

2.1 SINGLE-WALL PIPE AND FITTINGS

A. Polypropylene (PP) Drainage Pipe and Fittings: ASTM F 1412, pipe extruded and drainage-pattern fittings molded, with Schedule 40 dimensions, from PP resin with fire-retardant additive complying with ASTM D 4101; with fusion- and mechanical-joint ends.

1. Exception: Pipe and fittings made from PP resin without fire-retardant additive may be used for underground installation.
2. Manufacturers: Subject to compliance with requirements, provide products by Fuseal, Enfield Industrial Corp, or approved equal.

2.2 JOINING MATERIALS

A. Couplings: Assemblies with combination of clamps, gaskets, sleeves, and threaded or flanged parts; compatible with piping and system liquid; and made by piping manufacturer for joining system piping.

B. Adapters and Transition Fittings: Assemblies with combination of clamps, couplings, adapters, gaskets, and threaded or flanged parts; compatible with piping and system liquid; and made for joining different piping materials.

C. Flanges: Assemblies of companion flanges and gaskets complying with ASME B16.21 and compatible with system liquid, and bolts and nuts.

PART 3 - EXECUTION

3.1 PREPARATION

A. Interruption of Existing Laboratory and Healthcare Chemical-Waste Systems: Comply with requirements in Division 01 Section "Temporary Facilities and Controls."

3.2 EARTHWORK

A. Comply with requirements in Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

3.3 PIPING INSTALLATION

A. Chemical-Waste Piping Inside the Building:

1. Install piping next to equipment, accessories, and specialties to allow service and maintenance.
2. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used unless otherwise indicated.
3. Flanges may be used on aboveground piping unless otherwise indicated.
4. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
5. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
6. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
7. Install piping at indicated slopes.
8. Install piping free of sags and bends.
9. Install fittings for changes in direction and branch connections.

3.4 JOINT CONSTRUCTION

A. Chemical-Waste Piping Inside the Building:

1. Plastic-Piping Electrofusion Joints: Make polyolefin drainage-piping joints according to ASTM F 1290.
2. Dissimilar-Material Piping Joints: Make joints using adapters compatible with both system materials.

3.5 HANGER AND SUPPORT INSTALLATION

A. Pipe sizes in this article refer to aboveground, single-wall piping.

B. Comply with requirements in Division 23 Section "Hangers and Supports for Mechanical Piping and Equipment" for pipe hanger and support devices. Install the following:

1. Vertical Piping: MSS SP-69 Type 8 or MSS SP-69 Type 42, riser clamps.
2. Individual, Straight, Horizontal Piping Runs 100 Feet and Less: MSS SP-69 Type 1, adjustable, steel clevis hangers.

C. Comply with requirements in Division 23 Section "Hangers and Supports for Mechanical Piping and Equipment" for installation of supports.

D. Support horizontal piping and tubing within 12 inches of each fitting and coupling.

E. Support vertical piping and tubing at base and at each floor.

F. Rod diameter may be reduced 1 size for double-rod hangers, to minimum of 3/8 inch.

G. Install vinyl-coated hangers for PP piping with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 2: 33 inches with 3/8-inch rod.
2. NPS 2-1/2 and NPS 3: 42 inches with 1/2-inch rod.
3. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.

H. Install supports for vertical PP piping every 72 inches.

3.6 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Make connections to existing piping so finished Work complies as nearly as practical with requirements specified for new Work.

C. Install piping adjacent to equipment to allow service and maintenance.

D. Connect chemical-waste piping to sinks, specialties, accessories, and equipment. Use chemical-resistant coupling, adapter, or fitting as required for materials being joined. Mechanical joints allowed only within accessible laboratory casework for connection to plumbing fixtures.

3.7 LABELING AND IDENTIFICATION

A. Comply with requirements in Division 23 Section "Identification for Mechanical Piping and Equipment" for labeling of equipment and piping.

3.8 FIELD QUALITY CONTROL

A. Chemical-Waste Piping Inspection:

1. Do not enclose, cover, or put drainage and vent piping into operation until it is inspected and approved by Owner's Representative.
2. During installation, notify Owner's Representative at least 24 hours before inspection must be made. Perform tests specified below in presence of Owner's Representative:

    a. Roughing-in Inspection: Arrange for inspection of piping system before concealing after system roughing-in and before setting fixtures and equipment.
    b. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Reinspections: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

B. Chemical-Waste Piping Testing: Arrange for Owner's Representative to witness tests. Provide 7 days notice prior to tests. Test systems according to procedures of authorities having jurisdiction or, in absence of published procedure, according to the following:

1. Test for leaks and defects in new piping systems and parts of existing systems that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of system tested.
2. Leave uncovered and unconcealed new, altered, extended, or replaced piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
3. Rough-in Plumbing Test Procedure: Test piping at completion of piping roughing-in. Tightly close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before test starts through completion of test for minimum 2 hour duration, water level shall not drop. Inspect joints for leaks.
4. Final Plumbing Test Procedure: After plumbing fixtures and equipment have been set and their traps filled with water, test connections and prove gastight and watertight. Plug stack openings on roof and building drain where it leaves building, and introduce air into system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of fixture to measure pressure. Air pressure must remain constant for minimum 2 hour duration without introducing additional air throughout period of inspection. Inspect fixture connections for gas and water leaks.
5. Repair leaks and defects with new materials and retest system or portion thereof until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.9 CLEANING

A. Use procedures prescribed by authorities having jurisdiction or, if not prescribed, use procedures described below:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Clean piping by flushing with potable water.

END OF SECTION 22 66 00