

**SECTION 22 13 00
FACILITY SANITARY AND VENT PIPING**

PART 1 - GENERAL

1.1 DESCRIPTION

This section pertains to sanitary sewer and vent systems, including piping and all necessary accessories as designated in this section.

1.2 RELATED WORK

- A. Section 07 84 00, FIRESTOPPING: Penetrations in rated enclosures.
- B. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING: Pipe Hangers and Supports, Materials Identification.
- C. Section 07 92 00 Joint Sealants: Sealant products.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES.
- B. Manufacturer's Literature and Data:
 - 1. Piping.
 - 2. Floor Drains.
 - 3. Plaster Trap.
 - 4. Cleanouts.
 - 5. Decontamination Tank and accessories.
- C. Detailed shop drawing of clamping device and extensions when required in connection with the waterproofing membrane or the floor drain.

1.4 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society of Mechanical Engineers (ASME): (Copyrighted Society)
A112.6.3-01 (R 2007)....Standard for Floor and Trench Drains
- C. American Society for Testing and Materials (ASTM):
A74-06.....Standard Specification for Cast Iron Soil Pipe
and Fittings
- D. International Code Council:
IPC-06.....International Plumbing Code
- E. Cast Iron Soil Pipe Institute (CISPI):
301-05.....Hubless Cast Iron Soil Pipe and Fittings for
Sanitary, Waste, and Vent Piping Applications

310-04.....Coupling for Use in Connection with Hubless
 Cast Iron Soil Pipe and Fittings for Sanitary
 Waste and Vent Piping Applications

PART 2 - PRODUCTS

2.1 SANITARY WASTE, DRAIN, AND VENT PIPING

- A. Cast iron waste, drain, and vent pipe and fittings
 - 1. Cast iron waste, drain, and vent pipe and fittings shall be used for the following applications:
 - a. Pipe buried in or in contact with earth (bell and plain end).
 - b. Sanitary pipe extensions to a distance of approximately 1500 mm (5 feet) outside of the building (bell and plain end).
 - c. Interior waste and vent piping above grade (no-hub pipe and fittings).
 - 2. The material for all pipe and fittings shall be cast iron soil pipe and fittings and shall conform to the requirements of CISPI Standard 301, ASTM A-888, or ASTM A-74.
 - 3. Joints for hubless pipe and fittings shall conform to the manufacturer's installation instructions. Couplings for hubless joints shall conform to CISPI 310. Joints for hub and plain end pipe shall be installed with compression gaskets conforming to the requirements of ASTM Standard C-564.

2.2 EXPOSED WASTE PIPING

- A. Full iron pipe size chrome plated brass piping shall be used in finished rooms for exposed waste piping connecting fixtures, casework, cabinets and equipment when not concealed by apron including those furnished by the Government or specified in other sections.
 - 1. The Pipe shall meet Fed. Spec. WW-P-351, standard weight.
 - 2. The Fittings shall conform to ANSI B16.15, cast bronze threaded fittings with chrome finish, (125 and 250).
 - 3. Nipples shall conform to ASTM B 687, Chromium-plated.
 - 4. Unions shall be brass or bronze with chrome finish. Unions 65 mm (2-1/2 inches) and larger shall be flange type with approved gaskets.

2.3 CLEANOUTS

- A. Cleanouts shall be the same size as the pipe, up to 100 mm (4 inches); and not less than 100 mm (4 inches) for larger pipe. Cleanouts shall be easily accessible and shall be gastight and watertight. Minimum

clearance of 600 mm (24 inches) shall be provided for clearing a clogged sanitary line.

- B. **FC1:** Coated Cast Iron cleanout, round adjustable scoriated Nickel-Bronze top, flashing flange, taper thread-ABS plug, "speedi-set" gasket connection, 4" size, Jay R. Smith Fig. 4034L-F or equal.
- C. In horizontal runs above grade, cleanouts shall consist of cast brass tapered screw plug in fitting or caulked/hubless cast iron ferrule. Plain end (hubless) piping in interstitial space or above ceiling may use plain end (hubless) blind plug and clamp.

2.4 FLOOR DRAINS

- A. **FD1:** Coated Cast Iron floor drain and flashing collar, 6" round adjustable Nickel-Bronze top, "speedi-set" outlet, sediment bucket, 3" size, J.R. Smith Figure 2005L-A-B or equal.
- B. **FD2:** Polypropylene body floor drain, polypropylene combination invertible membrane clamp, adjustable polypropylene head, stainless steel frame and grate, 4" outlet, Zurn Industries Model Z9A-FD2-4 or equal.
- C. **FD3:** Coated Cast Iron floor drain and flashing collar, cast iron bar grate, 8 ½" round top, sediment bucket, "speedi-set" outlet, 4" size, J.R. Smith Figure 2110L-B or equal.
- D. **FD4:** Coated Cast Iron floor drain and flashing collar, 15" round top, cast iron vandal-proof dome grate, cast iron slotted sediment bucket, caulk outlet, 5" size, J.R. Smith Figure 2250C-D-U or equal.

2.5 TRAPS

- A. Traps shall be provided on all sanitary branch waste connections from fixtures or equipment not provided with traps. Exposed brass shall be polished brass chromium plated with nipple and set screw escutcheons. Slip joints are not permitted on sewer side of trap. Traps shall correspond to fittings on cast iron soil pipe and size shall be as required by connected service or fixture.
- B. **PT1:** Fabricated steel body solids interceptor, aluminum cover, acid resistant coating in and out, stainless steel perforated bucket, 1-1/2" threaded connections (inlet and outlet to be at the same elevation), J.R. Smith Figure 8714T-ARIO, or equal.

2.6 BACKWATER VALVE

- A. Coated Cast Iron body with intergral flapper type backwater valve, ferrule and cover (to be extended to finish floor with 8" riser), 5" hub and plain end connections, J.R. Smith Figure 7022S or equal.

2.7 DECONTAMINATION TANK

- A. **TK1:** Greenturtle "Proceptor" Model EHT 1000, or equal, 1000 gallon fiberglass oval holding tank, 96" long x 62" wide, vinyl ester lining, 6" vinyl ester inlet and outlet, 24" manway, two 3" diameter vent ports, extension collar. Unit to include Greenturtle High Level Monitor with audio visual alarm and auxiliary contacts, removable sensor pipe, set at 75% capacity level, with ultrasonic level switch. Furnish with East Jordan Iron Works Model 3715Z, or equal, heavy duty iron stacking manhole frame and Model 3705A manhole cover.

PART 3 - EXECUTION

3.1 PIPE INSTALLATION

- A. The pipe installation shall comply with the requirements of the International Plumbing Code (IPC) and these specifications.
- B. Branch piping shall be installed for waste from the respective piping systems and connect to all fixtures.
- C. Pipe shall be round and straight. Cutting shall be done with proper tools. Pipe shall be reamed to full size after cutting.
- D. All pipe runs shall be laid out to avoid interference with other work.
- E. Unless specifically indicated on the drawings, the minimum slope shall be as indicated in section 3.3.
- F. The piping shall be installed free of sags and bends.
- G. Seismic restraint shall be installed where required by code.
- H. Changes in direction for soil and waste drainage and vent piping shall be made using appropriate branches, bends and long sweep bends. Sanitary tees and short sweep quarter bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Long turn double wye branch and eighth bend fittings shall be used if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Proper size of standard increaser and reducers shall be used if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- I. Buried soil and waste drainage and vent piping shall be laid beginning at the low point of each system. Piping shall be installed true to grades and alignment indicated with unbroken continuity of invert. Hub ends shall be placed upstream. Required gaskets shall be installed

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

- J. Cast iron piping shall be installed according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings"

3.2 JOINT CONSTRUCTION

- A. Hub and plain end, cast iron piping with gasket joints shall be joined in accordance with CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
- B. Hubless or No-hub, cast iron piping shall be joined in accordance with CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless piping coupling joints.

3.3 PIPE HANGERS, SUPPORTS AND ACCESSORIES:

- A. All piping shall be supported according to the International Plumbing Code (IPC), Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING, and these specifications. Where conflicts arise between these the code and Section 22 05 11, the most restrictive or the requirement that specifies supports with highest loading or shortest spacing shall apply.
- B. Hangers, supports, rods, inserts and accessories used for pipe supports shall be shop coated with zinc chromate primer paint
- C. Horizontal piping shall be supported within 300 mm (12 inches) of each fitting or coupling.
- D. Horizontal cast iron piping shall be supported with the following maximum horizontal spacing and minimum hanger rod diameters:
 - 1. 40 mm or DN40 to 50 mm or DN50 (NPS 1-1/2 inch to NPS 2 inch): 1500 mm (60 inches) with 10 mm (3/8 inch) rod.
 - 2. 80 mm or DN 80 (NPS 3 inch): 1500 mm (60 inches) with 13 mm (½ inch) rod.
 - 3. 100 mm or DN100 to 125 mm or DN125 (NPS 4 to NPS 5): 1500 mm (60 inches) with 16 mm (5/8 inch) rod.
 - 4. 150 mm or DN150 to 200 mm or DN200 (NPS 6 inch to NPS 8 inch): 1500 mm (60 inches) with 19 mm (¾ inch) rod.
- E. Vertical piping shall be supported at the base, at each floor, and at intervals no greater than 4.57 m (15 feet).
- F. In addition to the requirements in Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING, floor, Wall and Ceiling Plates, Supports, Hangers shall have the following characteristics:

1. Solid or split unplated cast iron.
 2. All plates shall be provided with set screws.
 3. Height adjustable clevis type pipe hangers.
 4. Adjustable floor rests and base flanges shall be steel.
 5. Hanger rods shall be low carbon steel, fully threaded or threaded at each end with two removable nuts at each end for positioning rod and hanger and locking each in place.
 6. Riser clamps shall be malleable iron or steel.
- G. Miscellaneous materials shall be provided as required, for proper installation of hangers, supports and accessories. All necessary auxiliary steel shall be provided to provide that support.
- H. Cast escutcheon with set screw shall be provided at each wall, floor and ceiling penetration in exposed finished locations and within cabinets and millwork.
- I. Penetrations:
1. Fire Stopping: Where pipes pass through fire partitions, fire walls, smoke partitions, or floors, a fire stop shall be installed that provides an effective barrier against the spread of fire, smoke and gases as specified in Section 07 84 00, FIRESTOPPING. Clearances between raceways and openings shall be completely filled and sealed with the fire stopping materials.
 2. Water proofing: At floor penetrations, clearances shall be completely sealed around the pipe and make watertight with sealant as specified in Section 07 92 00, JOINT SEALANTS.
- J. Piping shall conform to the following:
1. Waste and Vent Drain to main stacks:

Pipe Size	Minimum Pitch
80 mm or DN 80 (3 inches) and smaller	2%
100 mm or DN 100 (4 inches) and larger	1%

2. Sanitary vents shall not connect to exhaust vents.

3.4 TESTS

- A. Sanitary waste and drain systems shall be tested either in its entirety or in sections.

B. Waste System tests shall be conducted before trenches are backfilled or fixtures are connected.

1. If entire system is tested for a water test, tightly close all openings in pipes except highest opening, and fill system with water to point of overflow. If the waste system is tested in sections, tightly plug each opening except highest opening of section under test, fill each section with water and test with at least a 3 m (10 foot) head of water. In testing successive sections, test at least upper 3 m (10 feet) of next preceding section so that each joint or pipe except upper most 3 m (10 feet) of system has been submitted to a test of at least a 3 m (10 foot) head of water. Water shall be kept in the system, or in portion under test, for at least 15 minutes before inspection starts. System shall then be tight at all joints.
2. After installing all fixtures and equipment, open water supply so that all p-traps can be observed. For 15 minutes of operation, all p-traps shall be inspected for leaks and any leaks found shall be corrected.
3. Final Tests: Either one of the following tests may be used.
 - a. Smoke Test: After fixtures are permanently connected and traps are filled with water, fill entire drainage and vent systems with smoke under pressure of 1.3 kPa (1 inch of water) with a smoke machine. Chemical smoke is prohibited.
 - b. Peppermint Test: Introduce (2 ounces) of peppermint into each line or stack.

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