

## SECTION 22 16 16

### SANITARY WASTE AND VENT PIPING

#### PART 1 GENERAL

##### 1.01 OPERATING AND MAINTENANCE DATA

- A. Include documentation of inspections and tests performed, including logs, curves, and certificates.
- B. Documentation shall note replacement of equipment or components that failed during testing.

#### PART 2 PRODUCTS

##### 2.01 MATERIALS

- A. Interior Storm Drain, Sanitary Sewer, Waste and Vent:
  - 1. Buried pipe:
    - a) Cast iron soil pipe with cast iron drainage fittings meeting ASTM A 74.
    - b) Joint materials and systems shall be hub and spigot with neoprene gaskets and lubricant.
    - c) PVC schedule 40 solid wall pipe and DWV fitting system:
      - i) Pipe and fittings shall be manufactured from PVC compound with a cell class of 12454 per ASTM D 1784 and conform with National Sanitation Foundation (NSF) standard 14. Pipe shall be iron pipe size (IPS) conforming to ASTM D 1785 and ASTM D 2665. Injection molded fittings shall conform to ASTM D 2665. Fabricated Fittings shall conform to ASTM F 1866.
      - ii) All pipe and fittings to be produced by a single manufacturer and to be installed in accordance with manufacturer's recommendations and local code requirements.
      - iii) WARNING – Never test with or transport/store compressed air or gas in PVC pipe or fittings.
      - iv) Solvent cements shall conform to ASTM D 2564. Primer shall conform to ASTM F 656. The system is intended for non-pressure drainage applications where the temperature will not exceed 140 degrees F.
  - 2. Suspended pipe:
    - a) Service weight (SV) cast iron pipe
    - b) "No Hub System" using hubless cast iron soil pipe couplings certified to withstand a minimum of 13 psig internal pressure.
    - c) No-Hub couplings shall be Husky SD 4000 or equivalent. Made in USA. All band sizes shall have minimum 4 straps. (larger bands may have 6 straps)
    - d) Meet CISPI 301 and ASTM A 888.
    - e) Where stack pressure may theoretically exceed 50 psig, use couplings with restrained joints horizontal and vertical up to 80 psig.
    - f) Where copper pipe is used, specify Type L.
    - g) PVC piping is strictly prohibited for any application within buildings. Exceptions can only be used for small diameter schedule 40 PVC piping being used for condensate drain piping from condensing boilers and HVAC coils routed to floor drains. Solid core schedule 40 PVC may be used for condensing boiler flue pipe permitted by manufacturer.
    - h) DWV copper piping is strictly prohibited on DPS projects.
- B. Acid Resistant Drain, Waste and Vent:
  - 1. Approved manufacturers:
    - a) Spears Lab Waste system, listed ASTM F 2618.
      - i) CPVC corrosive waste drainage system.

2. Meet requirements of ASTM D4101.

C. Air admittance valves not allowed.

### **PART 3 EXECUTION**

#### **3.01 INSTALLATION**

- A. Locate sewer vents away from air intakes. Avoid placing vents in lower roof areas. Extend vents to a height above adjacent construction when vents are within 20' of a change in roof elevation.
- B. Underground plumbing shall be surrounded by a minimum of 6" of "squeegee."
- C. Pipe shall be accurately cut and set in place without springing or forcing.
- D. Structure of the building shall not be compromised.
- E. Above ground piping shall run parallel with the lines of the building unless otherwise indicated.
- F. Bare, uninsulated pipe shall not bear directly on structural elements so as to transmit sound to the structure or prevent flexible movement of the lines.
- G. Change in direction of piping shall be made with fittings.
- H. Allowance shall be made for expansion and contraction of hot water piping. Provide expansion loops where required.
- I. Joints shall be made with fittings of compatible material and for the specific purpose intended.
- J. Pipes passing through concrete or masonry walls, floors, or roofs shall be provided with pipe sleeves fitted into place at the time of construction.
- K. Piping runs are prohibited above or in the following locations:
  - 1. Elevator machine rooms
  - 2. Telephone or computer equipment rooms
  - 3. Sensitive instrument and equipment rooms
  - 4. Electrical switchgear, busways and equipment rooms
- L. Caulking of screwed joints or holes is not acceptable.
- M. Air admittance valves not allowed. Always tie into existing vent or run new vent through roof. Island venting to be considered on case by case basis.
- N. Maximum waste arm distance between trap and vent (dirty Arm)
  - 1. 1 ¼" and 1 ½" – 3'-0" Max.
  - 2. 2" – 5'-0" Max.
- O. Minimum water closet waste to be 4" line.
- P. Liquid waste removal:
  - 1. The District's sanitary sewerage system is connected to the City of Denver Wastewater Management Division and must conform to requirements of the City and County of Denver.
  - 2. Design sanitary waste systems to allow for future addition of laterals to accommodate 20 percent building revisions.
  - 3. Per code, "vent pipe shall rise at least 6" in height above flood level of fixture (including floor drains) before offsetting horizontally." If this is not possible, combination waste and vents are required.
  - 4. Sanitary crosses are prohibited. For common drains between lavatories, use double wye or combo (Tyler, Fig. 1 or 5) or equivalent.
  - 5. Sanitary Tee's shall not be installed on back or side of any application.
  - 6. The use of sewage ejectors is strongly discouraged. However, if needed, obtain approval of DPS and specify submersible ejector pumps.
  - 7. Grease interceptor to have a designated vent. Do not tie into building vent system.

8. DPS now accepts individual interceptors for acid and chemical neutralization or dilution. Large capacity acid neutralization basins, installed outdoors, are still preferred for new construction.

**3.02 FIELD QUALITY CONTROL**

- A. Plumbing piping and fixtures shall be installed under the direct, on-site supervision of a journeyman plumber licensed by the State of Colorado. The ratio of plumbing apprentice-helpers shall not exceed two apprentice-helpers for each journeyman.
- B. Defective work found during tests and inspections shall be corrected and the tests repeated before acceptance.
- C. Plumbing systems shall be tested in accordance with NAPHCC Plumbing Code and other applicable codes.
- D. A smoke test shall be performed on sanitary vent lines prior to applying wall finishes. The test shall be witnessed by the DPS representative.

**END OF SECTION 22 16 16**