

SECTION 02600 - UTILITY PIPING MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SCOPE OF SECTION:

This section contains the requirements regarding utility piping of various types of material, including fittings and accessories.

(Division 2 items are generally considered to be located outside of buildings starting at a maximum distance of 5' outside of the building.)

1.2 IDENTIFICATION OF UNDERGROUND UTILITIES AND PIPING:

- A. **WARNING TAPE:** All underground piping and utilities shall have metalized warning tape installed or line that identifies the specific system buried below. Tape shall consist of a minimum 3.5 mil solid foil core encased in a protective plastic jacket (total thickness 5.5 mils) and be 6" wide with black lettering imprinted on a color coded background that conforms to APWA color code specifications. Tape shall be installed from 18" to 30" from the top of the pipe and in no case less than 6" below grade.
- B. **TRACER WIRE:** All non-metallic pipe installed underground (except pipe containing electrical lines) shall have a tracer wire installed along the length of the pipe. The wire shall be taped to the pipe and not allowed to "float freely" within the backfill. Tracer wire shall be 14-1-UF gauge minimum, copper single-conductor wire with type UF (Underground Feeder) insulation and shall be continuous along the pipeline passing through the inside of each valve box.

1.3 UTILITY STRUCTURES:

- A. **CLEANOUTS:** Cleanouts shall be provided at grade. Cleanout caps shall be made of brass. Surround cleanouts with concrete pad with chamfered edges. Pad shall be 18"x 18" x 6" with #10 gauge welded wire mesh.
- B. **MANHOLES AND COVERS:**
 - 1. **General - Manhole Construction:** All manholes shall either be constructed with precast concrete units or reinforced cast-in-place concrete.
 - a) **Reinforced Cast-In-Place Concrete Construction:**
 - 1) Reinforced cast-in-place concrete manholes shall be designed by a Florida-registered Professional Engineer.
 - 2) Entire manhole structure shall be rated for H20 traffic loading per Florida Department of Transportation (FDOT) standards.
 - b) **Precast Concrete Unit Construction:**
 - 1) Precast concrete units shall be manufactured in accordance with ASTM C478, Specifications for Precast Reinforced Concrete Manhole Risers and Tops. Concrete to be minimum 3000 psi at 28 days.

- 2) Entire manhole structure shall be rated for H20 traffic loading per Florida Department of Transportation (FDOT) standards.
 - 3) Joints between precast units shall be made using "Ram-Nek" sealant.
2. General - Manhole Installation, Relation to Grade: All manhole openings shall be installed so as to minimize surface water intrusion through the lid.
- a) In grassed areas, the opening shall be 3" above surrounding grade with a continuous gradual slope down from the opening; maximum slope is 1" per foot.
 - b) In paved areas, the opening shall be 1" above the surrounding grade with a continuous gradual slope down from the opening; maximum slope is 1/3" per foot.
3. Sanitary Sewer Manholes: Special requirements for sanitary sewer manholes are given below.
- a) Entrance Neck: Entrance neck is to be 24" maximum length.
 - b) Waterproofing: Outside of manhole shall be coated with bituminous material to prevent infiltration.
 - c) Interior Construction: Smooth channels shall be made at the manhole invert to convey sewage through manholes. These channels may be made using either sewer line pipe that has had the top half of the pipe removed, or grout that has been shaped and formed. The space between the half-pipe, or grout channel, and the manhole walls shall be filled with grout that is shaped to promote drainage back into the channel. The use of brick is allowed in constructing this grout shelf, but is not allowed elsewhere in manhole construction.
 - d) Ladder: No integral ladder is to be installed.
 - e) Manhole Spacing: Maximum spacing between sanitary sewer manholes shall be 350 feet.
 - f) Drop Manholes: Specify "drop" manhole if inlet invert is more than 2' above manhole invert. Drops for drop manholes shall drop on the outside of the manhole. Pour the outside pipe in concrete. Drop pipes inside of manhole are not permitted.
 - g) Covers: Provide 24" minimum diameter lids permanently marked "SANITARY". Lids are not to read "City of Gainesville". Acceptable products are: U.S. Foundry 170E lids and covers.
4. Storm Sewer Manholes: Special requirements for storm sewer manholes are given below.
- a) Entrance Neck: Entrance neck is to be 24" maximum length.
 - b) Ladder: No integral ladder is to be installed.
 - c) Manhole Spacing: Maximum spacing between storm sewer manholes shall be 350 feet.

- d) Covers: Provide 24" minimum diameter lids permanently marked "STORM". Lids shall not read "City of Gainesville". Acceptable products are: U.S. Foundry 170E lids and covers.
5. Chilled Water Manholes: All chilled water valves should be located in a manhole. Special requirements for chilled water manholes are given below.
- a) Minimum Size and Clearance: Minimum size manhole shall be 6' x 6' x 4', with at least 2' clearance between pipe/valves and parallel wall.
 - b) Waterproofing: Specify exterior bituminous coating to prevent infiltration.
 - c) Ladder: Provide an integral galvanized ladder.
 - d) Sump: Manholes shall have a 12" x 12" x 12" sump located beside the ladder.
 - e) Covers: Lid size should allow removal and replacement of all equipment. Minimum lid size shall be 24" minimum diameter. Lid should read "Chilled Water".
 - f) Vents, Drains, and Pressure Gauges: Vents (1/2 in.), Drains (1" min.) and pressure gauges shall be located on each side of the valves in manholes.
 - g) Valve Access: Manholes shall be laid out such that valves can be operated without needing a ladder to access the valves. Valves 5 inches and up shall be gear driven. Valves 4 inches and smaller shall have a stainless lever shaft and an operator.
6. Steam and Condensate Manholes: Special requirements for steam and condensate manholes are given below.
- a) Minimum Size: Steam and condensate manholes shall be a minimum size of 9' x 9' x 9'.
 - b) Number of Exits: Steam and condensate manholes shall have a minimum of two exits.
 - c) Waterproofing: Specify exterior bituminous coating on manholes to prevent infiltration.
 - d) Ladders: Steam and condensate manholes shall have a galvanized ladder installed at each of the two required exits.
 - e) Sump: Manholes shall have a 12" x 12" x 12" sump directly below pumping ring.
 - f) Covers: Manhole lids shall be perforated, with the ring having a diameter of 22" to 24" (or larger, if necessary to service, remove or install equipment). Lids to read "Steam".
 - g) Valve Access: Manholes shall be laid out such that valves can be operated without needing a ladder to access the valves.

1.4 PIPE AND FITTINGS:

- A. CAST IRON PIPE: Iron pipe installed in a corrosive area shall be wrapped in a plastic approved for underground applications. Cast iron pipe is not to be used outdoors.
- B. CORRUGATED METAL PIPE: The use of this product is not acceptable.
- C. DUCTILE IRON PIPE: Iron pipe installed in a corrosive area shall be wrapped in a plastic approved for underground applications.
- D. VITRIFIED CLAY PIPE: The use of this product is not acceptable.

1.5 VALVES AND VALVE BOXES:

- A. CHILLED WATER SYSTEM VALVES: Butterfly valves installed on horizontal piping should have their shafts oriented horizontally.
- B. VALVE BOXES: On potable water and both storm and sanitary sewerage (where applicable), valve boxes shall be cast iron. Surround with concrete pad, with chamfered edges. Pad shall be 18" x 18" x 8" with 6" x 6" #10 gage welded wire mesh. Lid should be marked "WATER", "SANITARY", or "REUSE" as appropriate. Boxes and lid material shall be AASHTO H-16 rated.

1.6 HYDRANTS:

- A. GENERAL:
 1. All hydrants shall be a dry-barrel, breakaway type with 5 1/4-inch seats, meeting AWWA C502 standards for dry-barrel hydrants.
 2. Hydrants shall have two 2 1/2-inch nozzle connections and one 4 inch nozzle connection. The nozzle section of the hydrant shall be able to rotate 360° during field installation.
 3. The rated water working pressure for all hydrants shall be 200 psi and tested to 400 psi by an independent laboratory testing agency.
 4. The main valve closure shall be compression type. The hydrant will be breakaway type so main valve will remain closed if hydrant is damaged by a vehicle.
 5. The main valve opening shall not be less than 5 1/4 inches. The internal working parts shall be removable through the top of the hydrant. The seat and subseat shall be made of bronze.
 6. The drainage system of the hydrant shall be activated by the main stem and shut-off by direct compression closure.
 7. A gate valve shall be installed in the line feeding the hydrant, as close as possible to the hydrant.
 8. Hydrant must have a 6" inlet pipe connection.
 9. Hydrant shall not have a tamperproof cover.

- B. INSTALLATION HEIGHT: Centerline of pumper nozzle shall be a minimum of 18" and a maximum of 22" above grade.
- C. ACCEPTABLE MANUFACTURERS: American Darling, Mueller.
- D. CLEARANCES: No obstructions within a 6' radius; and no building within 10'.
- E. OPERATION:
 - 1. Unless properly metered by the University, Constructors shall not operate fire hydrants for the purpose of using water on construction.
 - 2. Constructors shall not operate fire hydrants without proper fire hydrant tools. The use of pipe wrenches, monkey wrenches, or any other device not made for fire hydrant use is prohibited.

END OF SECTION