333000 Sanitary Sewerage Utilities

Sections Included In This Standard:

1.1 IDENTIFICATION OF UNDERGROUND UTILITIES AND PIPING

A. WARNING TAPE: All underground piping and utilities shall have non-detectable warning tape that conforms to the following requirements to identify the specific system buried below. Warning tape shall meet OSHA regulation 1926-956 (C) (I). Tape shall be 6" wide with black lettering imprinted on a color coded background that conforms to APWA color code specifications. Tape shall be installed between 18" to 30" above the top of the pipe and a minimum of 6" below grade.

   a. Any disturbance of this tape requires replacement after work is completed.

B. TRACER WIRE:

   a. All non- metallic pipes installed underground (except pipe containing electric wires and traceable communication lines) and all piping installed 6 feet or more below grade shall have a tracer wire installed along the length of the pipe. The tracer wire shall be taped to the pipe and not allowed to “float freely” within the backfill. The tracer wire shall be continuous without splicing from access point to access point along the length of the pipe. The tracer wire shall be accessible at all structures (valve boxes, meter pits, manholes, pull boxes, lift stations) along the length of the pipe. The tracer wire shall have an access point at the beginning and ending points of the pipe run with no distance between access points to exceed 400 feet within the pipe run.

   b. Tracer wire shall be Copperhead™ HS-CCS with RoHS compliant HDPE 30 mil insulation that utilizes virgin grade materials, rated for direct burial use at 30 volts, with conductor rated for 21% conductivity for locating purposes with a break load of 380# minimum and made in the USA or pre-approved equal.

   c. Tracer wire for piping less than 12” diameter shall be a #12 AWG and for piping greater than 12” diameter or 6 feet or more below grade shall be a #10 AWG

   d. Insulation color shall meet the APWA color code standard for identification of buried utilities.

      i. Sanitary Sewer – Green

   e. The routing of the tracer wire at structures shall be.
      i. Wire is attached to pipe until within 6” of the structure.
      ii. Wire is secured to the exterior of the structure (with corrosion resistant fasteners every 18”) in a vertical path from where pipe enters structure to top of structure.
      iii. Wire goes under or through (sealed) the metal ring of structure extending 2 to 3 inches into the structure, with wire held in place by a corrosion resistant fastener. If path is under metal ring the structure needs to be modified such that the wire is not pinched and any gaps sealed.

1.2 PIPING

A. Gravity Collection System Piping: PVC piping shall be in accordance with ASTM 3034D standards and SDR ratio applicable to the depth of burial as recommended by the manufacturer. Cement lined ductile iron class 50 is acceptable for special conditions.

B. Sanitary Force Main Piping: If PVC piping is used for the force main then the piping shall be DR-25, as a minimum, with mechanical joint fittings. PVC piping used for sanitary force mains will need to have a 14-1-UF gauge insulated wire attached to the pipe. The insulated wire shall be continuous through valve boxes. Pipe should be green in color or have a yellow stripe painted on top.

C. The use of vitrified clay pipe is unacceptable.

D. 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.

E. Only Shielded flexible couplings and adapters (i.e.Strongback Fernco) are allowed for use underground.

1.3 QUALITY ASSURANCE

All newly installed sanitary and stormwater piping shall be television inspected and recorded. The TV inspection recording shall provide a clear picture with audio. The picture shall contain the number of linear feet from the center of the manhole. The recording shall be turned over to PPD at Substantial Completion in DVD or MPEG format.

1.4 MANHOLES AND STRUCTURES

A. GENERAL

1. All manholes and underground utility structures shall either be constructed with precast concrete units or reinforced cast-in-place concrete.

2. 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. Back Water valves are not preferred on Campus. If a back water valve is required for a connection to a Sanitary structure approval must be in writing from the Director of the maintenance group for sanitary systems.

B. STRUCTURAL REQUIREMENTS

1. Manholes and underground utility structures shall be designed by an engineer

registered in the State of Florida based on ASTM C857 Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures with A-16 (AASHTO HS20) wheel loads. An additional load case consisting of A-12 (AASHTO HS15) wheel loads with 1/3 of the ASTM C857 impact and with Live Load Spacing of 32 inches rather than 4 feet shown in ASTM C857 Figure 1 shall also be considered.

2. As an alternate, precast, and reinforced cast-in-place, concrete manholes and underground utility structures with top slabs not longer than 48 inches maximum inside dimension conforming to the 2008 Florida Department of Transportation Design Standards Index No. 200 and Index No. 201 may be utilized without design by an engineer registered in the state of Florida.

3. Joints between precast units shall be made using "Ram-Nek" sealant.

C. SANITARY SEWER MANHOLES

1. Entrance Neck: 24" maximum length.

2. All adjustment rings for cover adjustment shall be precast. The use of bricks for adjustment is not allowed.

3. Waterproofing: Follow Standard 070000, 1.2 Below grade waterproofing for Sanitary structures

4. 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.

5. Ladder: No integral ladder is to be installed.

6. Manhole Spacing: Maximum spacing between sanitary sewer manholes shall be 350 feet.

7. Drop Manholes:
   i. New construction: Specify "drop" manhole if inlet invert is more than 2 feet 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 for new construction or inlets being added to the structure.
      1. This applies to all size pipes entering the structure.

8. 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.

D. VALVE BOXES: 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 shall be marked “SANITARY.” Boxes and lid material shall be AASHTO H-16 rated.

1.5 LIFT STATIONS

A. General: Lift stations shall be connected to the "OPTION ELEVEN" alarm system and shall signal an alarm for both power loss and high sump level. Contact Telecommunications for assistance in determining routing of a 2-inch conduit for the circuit.

B. Enclosure: Provide a factory-built fiberglass enclosure, with interior lighting and ventilation.

C. Pumps:

1. Shall be self-priming, horizontal, above ground.

2. Acceptable Manufacturer: Gorman-Rupp, Clone.

D. Controls:

1. Provide a free-standing control panel. The control system shall be driven by a PLC that is programmed with RS 500 Logix computer language and shall accept the existing PPD lift station control program. The cabinet shall be supplied with a generator receptacle and an emergency power supply control that separates line power form emergency power and does not allow the two power sources to supply power to the control cabinet simultaneously. The cabinet shall be equipped with an exterior power disconnect for lockout.

2. Float switches shall be Mercoid.

3. A red trouble light and horn shall be used to indicate high sump level. Provide a silence switch inside the enclosure.

4. Acceptable Manufacturers: Allan Bradley, Clone.

E. Miscellaneous:

1. Provide manhole covers for wet-well access. Minimum size: 30" X 30", or 30" diameter.

2. Provide a 4" emergency bypass pump-out connection, with a Cam-lok quick-connector.

F. Main Disconnect Panel: Provide a 100 Amp, 4 pole, corrosion resistant generator receptacle, "Hubbell" Box #BB1001W with "Hubbell" Plug # 4100 B5W and "Hubbell" Cap # PC100.

1.6 SEWER SYSTEM COMPONENT PROTECTION

A. All underground components of the Sanitary Sewer system shall be protected by a tree root barrier system. This includes, but is not limited to, piping, joints, manholes, valve boxes and lift stations.
   a. This applies only to components within 3’ of the surface.

B. This barrier system shall be installed on the sides of the trench made to install the component, not just wrapped around the component.

C. The preferred tree root barrier system is listed in the University Landscape master plan. Any deviation from this system shall need to be approved by Facilities Services.

END OF SECTION