

KEYNOTES:
 ① - LOWER WATERMAN TO PROVIDE 18" MINIMUM CLEARANCE BETWEEN SEWER AND WATER AT CROSSING.

SANITARY SEWER:

- Unless otherwise indicated, use reinforced, precast, concrete manhole holes conforming to ASTM C476, furnished with precast bases. Sanitary sewer manhole holes shall be supplied with pre-formed inverts and flexible impervious above coverboards for all lateral lines 36" or less (16 inches) in diameter or less, unless otherwise indicated. Joints for all precast manhole hole sections shall have gaskets, rubber "O"-ring gaskets in accordance with ASTM D463. These joints are normally used in sewers to hold infiltration and effluent to a practical minimum and are adequate for hydrostatic heads up to 35'. The inside barrel diameter shall not be less than 48 inches. See SUDAS Standard 58-331 for circular sanitary sewer lifts.
- All joints and connections in the sewer system shall be gas-tight or watertight. Inlet and outlet connections to sewer manholes must use flexible compression joints located between 12 and 36 inches from the manhole (see Uniform Plumbing Code (UPC) Section 719.6). Where permitted by the administrative authority, an approved installation method, approved radiant rubber joints or watertight gaskets may be used in order to make watertight connections to manholes and other structures (see UPC Section 301.2). Use Formex "Concrete Manhole Adaptor" or "Large Diameter Manhole Adaptor" or "Large Diameter Adaptor Ring", or approved equal. Cement mortar joints are permitted only for repairs or connections to existing lines having such joints.
- The building sewer starts 2 feet outside of the building. See Uniform Plumbing Code (UPC) part 715.1. Material installed within 2 feet of the building must be of materials approved for use inside of or within the building.
- Shall Solid-walled Polyvinyl Chloride (PVC) Plastic Pipe in accordance with SUDAS STANDARD SPECIFICATIONS, Division A, Sewers and Drains, Section 4010, Sanitary Sewers, Part 2.01 and as follows. Use SDR 26 Polyvinyl Chloride (PVC) Plastic Pipe for all designated PVC sanitary sewer services outside of the building. The PVC pipe shall meet or exceed the hydrostatic strength and requirements as set forth by the American Society for Testing and Materials (ASTM) D3034. PVC stiffness per ASTM D2412. Minimum pipe stiffness (ASTM) D3034. PVC plastic meeting ASTM D 1784, Cell Classification 12454 or 12364. Pipes must comply with ASTM D1986, D2885, or F794. Joints must be integral bell and gasket joints with electronic seal complying with ASTM D 3212 and ASTM F 477. The installation must comply with ASTM D2321, which requires open-trench installation on a continuous granular bed.
- Manhole inlet cleanouts on all sanitary sewer services in accordance with UPC part 719.0 and 1101.12. The distance between cleanouts in horizontal piping shall not exceed 100 feet for pipe 4-inch and over in size. Cleanouts shall be of the same nominal size as the pipes they serve. Include lead elbows and concrete base and pipe support. Lead 2 inches for frame and add 1/2 inch for 181818, or approved equal, over all cleanouts.
- Sanitary Pressure test of all sanitary sewer lines in accordance with the UPC parts 712.0 and 723.0. Test of flexible sanitary sewer lines for deflection after the sewer has been installed and backfill has been in place for at least 30 days. No pipe shall exceed a deflection of 1/2". If the test fails, make necessary repairs and retest.
- Install flexible watertight frame/coverways on all sanitary sewer manhole holes in order to seal the outside of the coverway from the cost iron frame down to the curb. The seal shall be a continuous seamless band made of high quality EPDM (Ethylene Propylene Diene Monomer) rubber with a minimum thickness of 65 mils. Use Internal/External Adaptor Seal as manufactured by Adaptor, Inc. (www.adaptorinc.com/ep-seal) or www.adaptorinc.com/ep-seal/2018/04/04/ep-seal-adaptor-seal. Inlet/Outlet Seal-Band use plastic coated sealing system as manufactured by Sealing Systems, Inc. (www.sealingsystems.com), or approved equal.
- Use SUDAS Standard 58-801 coating with self-sealing, acid type A 14, or approved equal, on all sanitary sewer manhole holes. Covers shall bear the "Sanitary Sewer" label.
- Grease Interceptor: The grease interceptor shall be readily accessible. Manhole covers for grease interceptors shall be provided with a substantial, fixed, gas-tight cover of concrete, steel, cast iron or other approved material. Manhole covers shall terminate at or above grade and shall have an approved locking device. A minimum self-lock permanent label shall be affixed to the manhole cover, identifying the interceptor tank with the words GREASE INTERCEPTOR.
- Trace Wire: Install tracing wire on all conductive and non-conductive storm sewer, sanitary sewer, and water lines in accordance with the MWA Trace Wire Specification Table and Details (www.mwa.com/MSD/TraceWireSpecTable/Invert0802.pdf). Use #12 HDPE-insulated copper-clad steel wire rated for underground service. The color of the insulating jacket shall be as follows: ground-roof, storm sewer-green, sanitary sewer-purple, and water blue-tan. Install the wire on the bottom side of the pipe below the spring line. Fasten the wire to the pipe with tape or plastic ties at 5' intervals. Do not wrap the trace wire around the corresponding utility. Do not connect the trace wire to existing conductive utilities. Use Copperhead Drycon 3-Way or Locking Steel Wire Connectors rated for underground direct bury applications or approved equal at all crossings or service connections. Trace wire connectors are not allowed. Trace wire must be properly grounded at all dead ends and services. Install grade-low/ground trace wire access boxes and drive-in magnesium grounding anodes at all dead ends, services, and fire hydrants. Trace wire access boxes shall be color coded as follows: storm sewer-green, sanitary sewer-purple, and water blue-tan.
- Detectable Warning Tape: Install detectable underground warning tape directly above all underground utilities at a depth of 457 mm (18 inches) below finished grade, unless otherwise indicated. Underlayment warning tape shall be 3-inch wide with a minimum 0.5 mil overall thickness. Tape shall be manufactured using a 0.8 mil clear vinyl polypropylene film, woven printed and laminated to a 0.3 mil solid aluminum foil core, and then laminated to a 3.75 mil clear vinyl polypropylene film. The aluminum backing makes underground cables easy to find using a non-invasive locator. Tape shall be printed using a digitally offset design for maximum visibility and meet the APWA Color-Code standard for identification of buried utilities. Use Pro-Line Safety Products (www.pro-line.com) detectable marking tape or approved equal.
- The minimum depth of cover for sanitary sewer without insulation is 5 feet. Insulate sanitary sewer services at locations where the depth of cover is less than 5 feet. Provide a minimum insulation thickness of 4 inches. The insulation must be at least 4 feet wide and centered on the pipe. Install the insulation boards 6 inches above the top of the pipe or mechanically attached and leveled pipe bedding material. Use high density, closed cell, rigid board material equivalent to DOW Styrofoam High-Density 40 Polystyrene Insulation. Individual insulation board dimensions typically measure 4' wide by 8' long by 2" thick.
- Install all pipe with the ASTM identification numbers on the top for inspection. Determine pipe laying of the lowest point in the proposed sewer line. Field verify that there is positive drainage at the outfall location. Lay the pipe with the bell end or existing grade end of the pipe pointing upstream. When connecting to an existing pipe, uncover the existing pipe in order to allow any adjustments in the proposed line and grade before laying any pipe. Do not lay pipe in water or when the trench conditions are unstable for such.
- Sanitary Sewer Service Connection to Existing Manhole: Cut-in a sanitary sewer eye of a manhole material or make the connection according to SUDAS 4010, Article 3.05. All manhole top or eye fittings must provide an integral rubber gasket in the branch for positive protection against service pipe leakage beyond the inlet of the sewer main pipe size.
- Terminate all new sewer stubs with a water-tight gasketed cap properly braced in order to withstand the infiltration-suffocation test. Install grade-low/ground trace wire access boxes and drive-in magnesium grounding anodes at the end of all stubs.
- Review all existing lines prior to connection.



