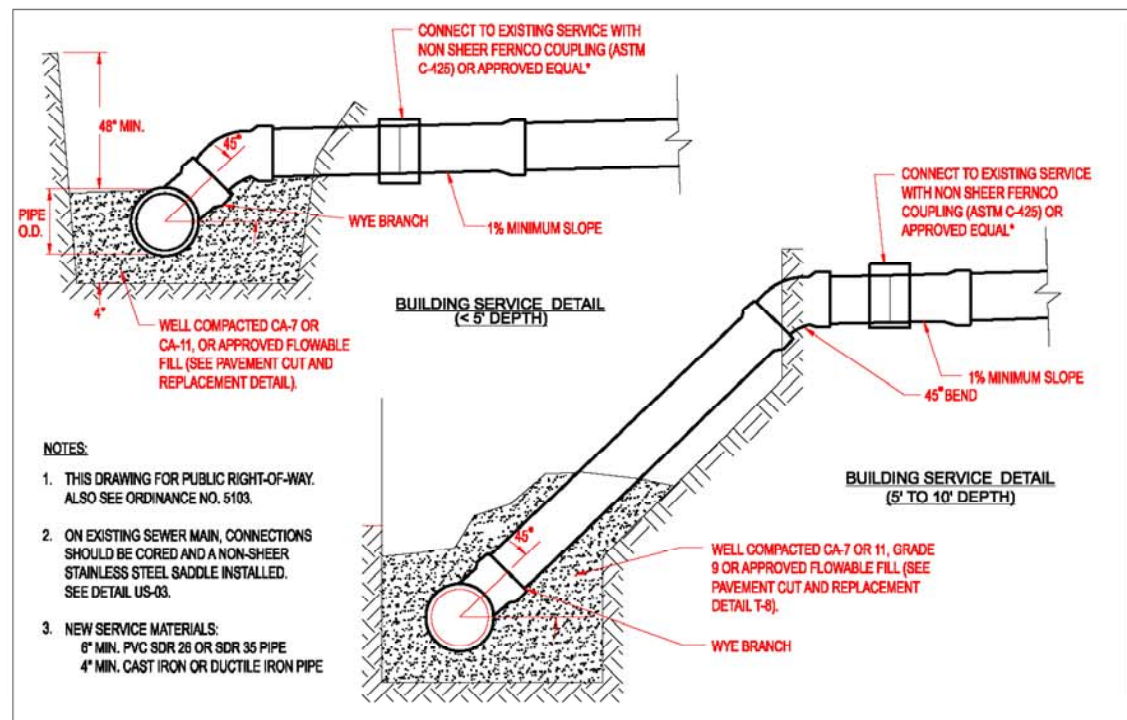


**SANITARY SEWER:**

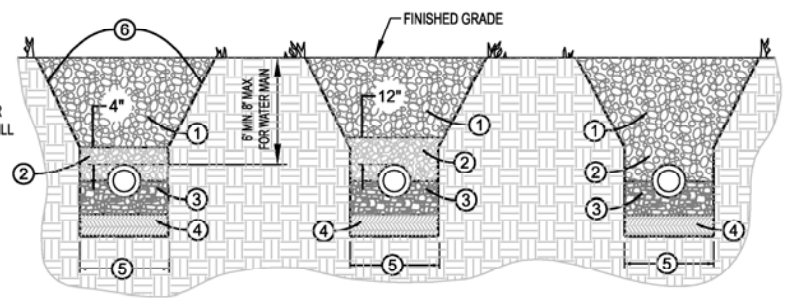
- Non-shear stainless steel couplings shall be used when connecting sewer pipes of dissimilar materials and pipes with no hub joints. When connecting to an existing sanitary sewer by means other than an existing wye or manhole, contractor shall use a Shower-Tap and hub-wye or hub-tee saddle.
- Unless an alternate method is approved, water stop gaskets shall be provided at all sanitary sewer manhole connections. Type and manufacturer to be approved by the City.
- PVC plastic sewer pipe and fittings of sizes 4-inch through 15-inch shall conform to the latest revised specification requirements of ASTM D3034 for type PSM polyvinyl chloride (PVC) sewer pipe and fittings of minimum wall thickness SDR 35.
- Joints shall be either the solvent weld type conforming to the latest revised specification requirements of ASTM D2584 and ASTM D2855, or elastomeric gasket type conforming to the latest revised specification requirements of ASTM D1869 and ASTM D3212.
- A thicker walled pipe such as SDR 26 may be specified by the engineer depending on design and/or field conditions.
- PVC plastic sewer pipe and fittings of sizes 18-inch through 36-inch shall conform to the latest revised specification requirements of ASTM F679 or polyvinyl chloride (PVC) large diameter ribbed gravity sewer pipe and fittings, with integral bell gasketed joints and elastomeric gaskets to form a watertight seal conforming to the latest revised specification requirements of ASTM F477 or ASTM D3212.
- Pipe and fittings shall be the products of one approved manufacturer only, and there shall not be any mixing of pipe and fittings of different manufacturers.
- The handling and installation of pipe, assembly or joints, and manhole connections shall be in accordance with the manufacturer's recommendations.
- Gasket-type waterstop collars consist of a neoprene collar and a stainless steel band or other approved manhole waterstop shall be installed wherever the pipe passes through the manhole walls to provide a watertight joint to prohibit infiltration into the sewer system.
- PVC pipe shall be installed in accordance with the latest revised specification requirements of ASTM D3221 using either compacted class I or class II granular embedment materials for bedding, haunching and initial backfill of 12 inches over the top of pipe to provide the necessary support for the pipe so that the maximum deflection does not exceed five percent (5%) of the pipe's original internal diameter.
- The Contractor shall provide the necessary tools and equipment and perform the work necessary to test the deflection in the initial 1,200 feet of installed sewer and not less than ten percent (10%) of the remainder of the sewer project at random locations selected by the engineers no sooner than 30 days after backfilling has been completed. In the event that deflection exceeds the maximum limit of five percent (5%), the Contractor shall test all other new flexible pipe for deflection. Deflection shall be tested by use of either a mandrel or rigid bell having a diameter equal to ninety-five percent (95%) of the inside diameter of the pipe, and the test shall be performed without using mechanical pulling devices. Whenever the deflection limitation is exceeded, the contractor shall uncover the pipe, carefully replace compacted embedment and backfill material, and retest for deflection.
- The Contractor shall subject all sanitary sewers, including service lines, to an air test. Allowable infiltration shall not exceed 100 gallons per inch diameter of pipe per mile per day. Televising of testing, cost for televising, and testing shall be the responsibility of the Contractor.
- Cast Iron Soil Pipe: service weight cast iron soil pipe and fittings conforming C.I.S.P.I. Specification HS-67 with compression type rubber gasket joints conforming to ASTM specification C564, or other suitable materials approved by the City Engineer.

Approved: City Engineer <i>Victor C. Ramirez, P.E.</i> Victor C. Ramirez, P.E. Director of Engineering and Building	Drawing Name <b>STANDARD NOTES AND SPECIFICATIONS</b>	Drawing Number <b>GE-02c</b>	Date: 6/1/2007	
Drawn: EM	Checked: LZ	CRYSTAL LAKE ILLINOIS Engineering Division		

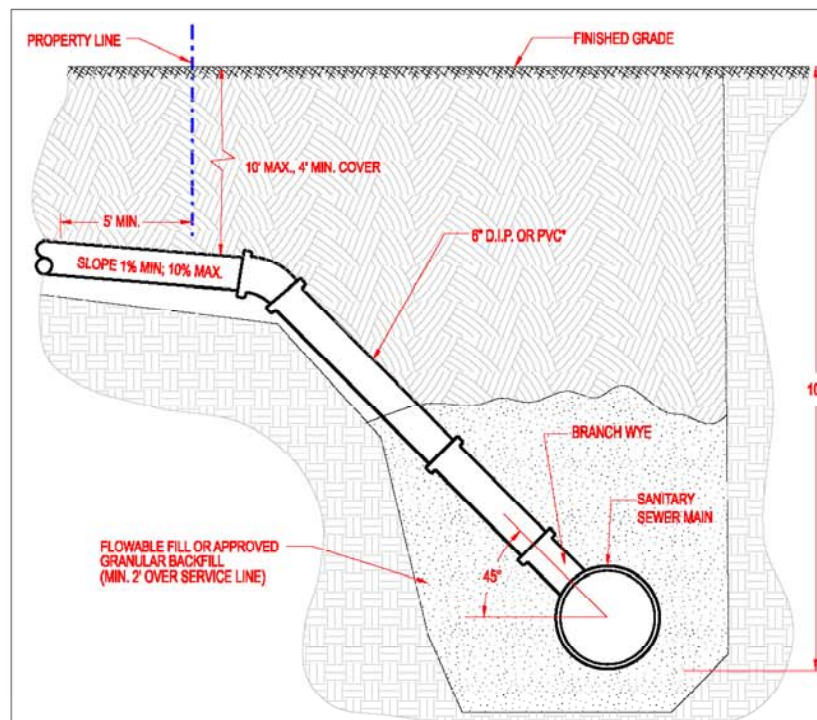


Approved: City Engineer <i>Victor C. Ramirez, P.E.</i> Victor C. Ramirez, P.E. Director of Engineering and Building	Drawing Name <b>SANITARY SERVICE RISER (DEPTH &lt; 10')</b>	Drawing Number <b>US-01</b>	Date: 4/15/2007	
Drawn: EM	Checked: TH	CRYSTAL LAKE ILLINOIS Engineering Division		

- TRENCH BACKFILL TO SUBGRADE AND WITHIN 2 FEET OF PROPOSED PAVEMENT, DRIVEWAY, CURB AND GUTTER OR SIDEWALK. TRENCH BACKFILL MATERIALS SHALL BE IDOT APPROVED GRADATION CA-6, GRADE 7, 8, OR 9 COMPACTED TO 90% OF MODIFIED PROCTOR DENSITY. IN NON-STRUCTURAL AREAS BACKFILL WITH APPROVED EXCAVATED MATERIALS.
- INITIAL BACKFILL TO DEPTH AS INDICATED. MATERIAL SHALL BE IDOT APPROVED GRADATION CA-6, GRADE 7, 8, OR 9.
- PIPE BEDDING SHALL BE FRACTURED GRANULAR MATERIAL IDOT GRADATION CA-7 OR CA-11 FROM 4 INCHES BELOW HORIZONTAL CENTER OF PIPE.
- UNSUITABLE MATERIAL TO BE REMOVED WHERE DIRECTED BY THE ENGINEER AND REPLACED WITH COMPACTED SUITABLE MATERIAL.
- TRENCH WIDTH:  
PIPE O.D. + 12 INCHES MINIMUM  
PIPE I.D. + 18 INCHES MAXIMUM
- CONTRACTORS SHALL COMPLY WITH THE LATEST OSHA STANDARDS INCLUDING, BUT NOT LIMITED TO: SLOPING AND BENCHING TRENCHING WALLS; TRENCH SUPPORT AND SHORING SYSTEMS; SHIELD SYSTEMS; AND HAZARDOUS ATMOSPHERES.



Approved: City Engineer <i>Victor C. Ramirez, P.E.</i> Victor C. Ramirez, P.E. Director of Engineering and Building	Drawing Name <b>TYPICAL TRENCH CROSS SECTION</b>	Drawing Number <b>UG-03</b>	Date: 6/1/2007	
Drawn: EM	Checked: LZ	CRYSTAL LAKE ILLINOIS Engineering Division		



Approved: City Engineer <i>Victor C. Ramirez, P.E.</i> Victor C. Ramirez, P.E. Director of Engineering and Building	Drawing Name <b>SANITARY SERVICE RISER (DEPTH &gt;= 10')</b>	Drawing Number <b>US-02</b>	Date: 4/15/2007	
Drawn: EM	Checked: TH	CRYSTAL LAKE ILLINOIS Engineering Division		