SECTION 02730
SANITARY SEWER SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:

1. Sanitary sewer system and appurtenances.

B. Related Sections:

1. Section 02200 - Earthwork.
2. Section 02221 - Trenching, Backfilling, Compacting.
3. Section 02722 - Drainage Structures and Piping.
4. Sewer service connections to building: Division 15 sections.

1.2 SUBMITTALS:

A. Record Drawings:

1. At project closeout, submit record drawings of installed sanitary sewer system piping and products, in accordance with requirements of Section 01720.

1.3 QUALITY ASSURANCE:

A. Manufacturer's Qualifications:

1. Firms regularly engaged in manufacture of sanitary sewer system's products, and whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer's Qualifications:

1. Firm with at least 3 years of successful installation experience on projects with sanitary sewer work similar to that required for project.

C. Codes and Standards:

1. Conform to City of Boulder Standard Specifications for Water Utilities except where more specific or stringent requirements are specified herein.

D. Tap Permits:

1. Main Campus: Obtain tap permit and pay all costs associated therewith from the Department of Facilities Management, Civil Division.

2. All Other Locations: Obtain tap permit and pay all costs associated therewith from the City of Boulder.
PART 2 - PRODUCTS

2.1 SEWER PIPE AND FITTINGS:

A. Polyvinyl Chloride (PVC) Pipe:
   2. Locations: All locations except at inaccessible locations where corrosive soils do not exist. Corrosive soils are defined as locations where the Soils Report recommends the use of Type II, Type II modified, or Type V ASTM C150 portland cement.

B. Ductile Iron:
   1. AWWA C151, Class 52 with push on joints; cement mortar lined, AWWA C104. Encase all pipe fittings with 8 mil polyethylene film tube complying with AWWA C105.
   2. Locations: All inaccessible locations where corrosive soils do not exist. Corrosive soils are defined as locations where the Soils Report recommends the use of Type II, Type II modified, or Type V ASTM C150 portland cement.

2.2 PIPE BEDDING:

A. Provide pipe bedding materials as specified in Section 02221.

B. Flowable Fill: Lean concrete made from ASTM C150, Type II portland cement.

2.3 IDENTIFICATION:

A. Underground Type Plastic Line Marker:
   1. Manufacturer's standard permanent, continuous-printed plastic tape with metallic core, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide green tape with black printing reading "CAUTION SANITARY SEWAGE LINE BURIED BELOW".
   2. Provide identification markers of one of the following:
      a. Allen Systems, Inc.
      b. Emed Co., Inc.
      c. Seton Name Plate Corp.
PART 3 - EXECUTION

3.1 TRENCHING AND BEDDING:

A. Trench Excavation:
   1. Conform to requirements of Section 02221.
   2. Where trench does not have sufficient strength to support pipe and bedding provide compacted trench stabilizing material or flowable fill, 6” minimum depth.

B. Bedding:
   1. Conform to the requirements of Section 02221.

3.2 INSTALLATION OF IDENTIFICATION:

A. During backfilling and topsoiling of underground sanitary sewer piping, install continuous underground plastic line markers, located directly over buried lines at 6” to 8” below finished grade.

3.3 PIPE INSTALLATION:

A. Carefully examine pipe and fittings for cracks and other defects. Reject ductile iron pipe if grooves in bells are not full and continuous.

B. Install plastic pipe in accordance with manufacturer's recommendations and ASTM D2321.

C. Install ductile iron pipe in accordance with AWWA C600.
   1. Install polyethylene encasement according to AWWA C105 on pipe and pipe fittings.

3.4 CLOSING ABANDONED UTILITIES:

A. Close open ends of abandoned underground utilities which must remain in place. Provide sufficiently strong closures to withstand hydro-static or earth pressure which may result after ends of abandoned utilities have been closed.
   1. Close open ends of concrete utilities with not less than 8” thick brick masonry bulkheads.
   2. Close open ends of piping with plastic plugs, or other acceptable methods for size and type material being closed. Wood plugs are not acceptable.

3.5 TAP CONNECTIONS:

A. Connections to existing conduits and underground structures shall be made so that the finished work will conform as nearly as practicable to the requirements specified for new work.
3.6 BACKFILL:

A. Pipe Cover:

1. Use specified bedding material for pipe cover material. Use cover material that is clean, free from organic materials, chunks of soil, frozen material or other unsuitable materials.

2. Place and compact cover material starting at top of pipe bedding extending upwards to a distance of 1' above top of pipe. Place in lifts which achieve a density of 95%, ASTM D1557 at a point 6" above top of pipe.

B. Backfill:

1. Conform to requirements of Section 02221.

3.7 COMPACTION:

A. Compact backfill following requirements of Section 02221.

3.8 WATER LINE AND SANITARY SEWER CROSSINGS:

A. Whenever possible lay water mains over sanitary sewers to provide vertical separation of at least 18" between invert of water main and crown of sewer.

B. Provide one continuous length of watertight sewer pipe 20' long centered on water main with joints between different pipes encased in 6" minimum of concrete. Support sewer pipe on flowable fill for not less than 10' either side of water main.

3.9 FIELD QUALITY CONTROL:

A. Notify Architect, Owner and governing authorities (if any) at least 8 working hours in advance of pipe being laid in any trench and 16 working hours in advance of testing. Do not cover pipes until observed by Architect and approved by Owner and governing authorities (if any).

3.10 CLEANUP AND RESTORATION:

A. Restore pavements, curbs and gutters, utilities, fences, lawns, vegetation and other improvements to condition equal to or better than before work began and to satisfaction of Architect.

B. Complete topsoil and restoration of site, if required.

C. Remove and legally dispose of all excess waste materials off site.

END OF SECTION 02730