SECTION 02730
SANITARY SEWER SYSTEMS

PART 1 – GENERAL

1.1 SUMMARY:

A. Section Includes:

1. Materials, installation, and testing of gravity sewer pipe and appurtenances conforming to ASTM D 3034 or ASTM F 789.

B. Related Sections:

1. Section 02730 Sanitary Sewer System.

2. Section 02513 Asphaltic Concrete Paving.

3. Section 02520 Portland Cement Concrete Paving.

4. Section 02221 Trenching, Backfilling and Compacting.

5. Section 02200 - Earthwork.

6. Section 02722 - Drainage Structures and Piping.

7. Section 02400 – General Utility Standards.

8. Sewer service connections to building: Division 15 sections.

C. Related Standard Details

Refer to City of Boulder’s Technical Drawings for standard details.

1.2 INTENT:

A. All improvements proposed to the University’s wastewater utility system shall conform with the goals, policies, and standards adopted in the UCB Civil Utility Master Plan.

1.3 CODES & STANDARDS:

A. The most recent City of Boulder Design & Construction Standards are incorporated by reference into the University’s Standards. When there is a conflict between standards, the more stringent requirement shall apply. The University’s Civil Engineer must approve in writing any deviation from these
standards prior to construction.

B. The most recent International Plumbing Code

C. The most recent International Building Code

1.4 DESIGN:

A. Design shall be in accordance with the City of Boulder’s Design and Construction Standards, Chapter 6.

B. The University’s preference in design is to minimize the number of service connections and manholes for new buildings.

C. Please consult University Engineer for peaking factors.

PART 2 - PRODUCTS

2.1 SEWER PIPE AND FITTINGS:

A. Comply with the City of Boulder’s Design and Construction Standards, Chapter 9, Utilities Standards.

B. Pipe penetrations through foundation or tunnel walls shall use Link-Seal® or approved equivalent.

2.2 CONCRETE MANHOLES:

A. Comply with the City of Boulder’s Design and Construction Standards, Chapter 9, Utilities Standards.

B. Manholes shall be required at all service connections for wastewater service lines six (6) inches in diameter and larger.

C. All manholes shall be designed and constructed with a minimum drop through the manholes as follows:

1. 0.1 foot for straight through sewer mains.

2. 0.2 foot at a change in sewer main alignment or intersection of connecting sewer mains.

D. Grade Adjustment: Any time grade above a manhole is adjusted, the contractor shall raise/lower the manhole risers. The manhole must not have less than 6” or more than 23” of mud rings plus manhole risers. If the amount is over/under, then the contractor shall add/subtract barrel sections.
E. Depth: Manholes with a depth of 3’-6” of less shall use a concentric flat top.

2.3 PIPE BEDDING:
  
  A. Comply with the City of Boulder’s Design and Construction Standards, Chapter 9, Utilities Standards.

2.4 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".

PART 3 - EXECUTION

3.1 TESTING:
  
  A. Comply with the City of Boulder’s Design and Construction Standards, Chapter 9, Utilities Standards. All sections of sewer shall be tested. Including but not limited to pipe between manholes and pipe from buildings to manholes or mains.

3.2 TRENCHING, BEDDING, & BACKFILL:
  
  A. Comply with UCB Standards Section 02221.

3.3 INSTALLATION OF IDENTIFICATION:
  
  A. During backfilling and top-soiling of underground sanitary sewer piping, install continuous underground line markers, located at two (2) depths, 1’ below grade and 2’ above pipe.

3.4 PIPE INSTALLATION:
  
  A. Comply with the City of Boulder’s Design and Construction Standards, Chapter 9, Utilities Standards.

  B. Handle pipe and fittings to insure delivery in a sound, undamaged condition. Do not store materials on the ground. Use covers to protect materials from direct sunlight.

3.5 INSTALLING LATERALS: FOR SERVICE LINES LESS THAN 6-INCHES IN DIAMETER:
A. Each wye branch fitting shall have its barrel diameter equal to the diameter of the sanitary sewer main and the spur (or branch) diameter as indicated on the plans. Do not place wye branches within 5 feet of any structure.

B. Install wye fittings so that the outlet branch is inclined upward at an angle of 45 degrees. Plug wye branch fittings that are to be left unconnected with a stopper or plug. Join laterals to the wye branch fittings at the sanitary sewer main by eighth bends. Eighth bends and quarter bends are a part of a lateral sewer line.

C. End of the lateral shall be at least 3 feet below the existing or proposed grade of the ground a existing structure to be served or as called for on the plans.

D. Where possible, laterals shall run perpendicular to the sewer main at a minimum of 2%. Bed laterals the same as the sewer main into which they connect.

E. Plug laterals with stopper in the socket of the last joint. Seal stopper in place so that it will withstand the internal pressure during the test for leakage and also that it may be removed without damage to the socket.

F. Cleanouts shall be provided and shown on the drawings.

3.6 SLIPLINING, BORING AND CURE-IN-PLACE-PIPE:

A. Sliplining, boring and cure-in-place-pipe shall be allowed for pipe rehabilitation on a project by project basis at the discretion of the UCB Civil Engineer.

3.7 CLOSING ABANDONED UTILITIES:

A. Close open ends of abandoned underground utilities which are indicated to remain in place. Provide sufficiently strong closures to withstand hydrostatic or earth pressure which may result after ends of abandoned utilities have been closed. Wood plugs are not acceptable.

3.8 TAP CONNECTIONS:

A. Make connections to existing conduits and underground structures, so that the finished work will conform as nearly as practicable to the requirements specified for new work.

3.9 FIELD QUALITY CONTROL:

A. Notify the Owner’s Representative and governing authorities (if any) at least 24 working hours in advance of pipe being laid in any trench and 16 working hours in advance of testing. Do not cover pipes until inspected by the Owner’s Representative and governing authorities (if any).
4.0 CLEANUP AND RESTORATION:

A. Comply with the City of Boulder’s Design and Construction Standards, Chapter 9, Utilities Standards.

END OF SECTION 02730