

PART 1 GENERAL

1.1 SCOPE

- A. This item shall include the work necessary for the installation of storm sewer line construction.
- B. Reference Section 3800 "Trenching and Backfill" and the General Conditions, specifically, but not limited to, Articles E.8, E.9, E.10, H.3, H4, H.5 and H.6.

PART 2 PRODUCTS

2.1 GENERAL:

- A. Contractor shall furnish, to the Engineer, all materials certifications available from the manufacturer for all required materials.
- B. All material shall be new and of U.S. manufacture including pipe, fittings and etc. unless approved prior to installation through the submittal process.

2.2 BEDDING AND BACKFILL MATERIAL:

- A. Aggregates imported for trench bedding and backfill shall conform to Section 2300 of these Specifications.

2.3 STORM SEWER PIPE:

- A. Storm sewer pipe and service laterals shall be of the type specified in Section 2600.

PART 3 EXECUTION

3.1 HANDLING AND STORAGE:

- A. All material (pipes, fittings, and etc.) shall be handled with care to avoid damage. Material shall not be dropped, bumped, or allowed to impact on itself.
- B. The Contractor shall provide safe storage for material until it has been incorporated into the work. The interior of all pipe, couplings, rings, fittings, and other accessories shall be kept free from dirt and other foreign matter at all times. Valves shall be drained and stored in a manner that will protect them from damage by freezing and high water. The Contractor, at no expense to the Owner, shall replace damaged materials.
- C. While cleaning pipe and fittings, wire brush if necessary and wipe clean, dry and free from oil, dirt, grease, and other foreign matter before the pipe is laid.
- D. All pipes and fittings shall be carefully inspected before being laid and no cracked, broken, or defective pipe or fitting shall be used in the work.

3.2 TRENCH EXCAVATION, BACKFILL, AND BEDDING:

- A. Trench excavation shall conform to Section 3800 of these Specifications.

3.3 PIPE ALIGNMENT AND GRADE:

- A. All pipe shall be laid to and maintained at the lines and grades required by the Plans. All fittings and valves shall be installed at the required locations with joints centered, spigots home, and plumb.
- B. Every fourth section of pipe 10-foot and over shall be checked for depth of cover or every 50-foot for pipe sections under 10-foot.
- C. When a section or sections are found to be out of alignment or grade they shall be removed and placed at the correct alignment and/or grade. If fill is required to readjust use 1-inch minus aggregate, conforming to Section 2300, thoroughly compacted to the satisfaction of the Engineer.
- D. Maximum deviation from true line, as established by the Engineer, shall not exceed ½-inch.
- E. Bellies shall not exceed 1/24th of an inch per diameter-inch of the pipe constructed. Bellies in excess shall be removed and replaced at no expense to the Owner.

3.4 PIPE INSTALLATION:

- A. Prior to excavation Contractor shall call for utility locating services of all existing utilities. Care shall be exercised during excavation to avoid damage to existing structures and utilities.
- B. Obstructions encountered shall be handled in accordance with Article E (8) of the General Conditions.
- C. Under no circumstance shall pipe be place in standing water.
- D. Extreme care shall be exercised to insure that the inside surfaces of the bell are smooth and free from any projections which would interfere with the assembly or watertightness of the joints. Every precaution shall be taken to prevent foreign materials from entering the pipe while it is being placed in the trench. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe.
- E. Prior to installing rubber gasket type joints, the end of the pipe to be joined, the inside of the joint, and the rubber ring shall be thoroughly cleaned by scrubbing with a brush and washing with water or other approved method. The method of installing rubber ring gaskets varies slightly with products of a different manufacturer and no standard instructions are applicable. Gaskets furnished under this specification shall be installed in strict accordance with the manufacturer's recommendations and as approved by the Engineer.

- F. A pipe soap type lubricant or other type approved by the pipe manufacturer shall be mopped on the inside surfaces of the bell and on the rubber gasket immediately prior to forcing the pipe home. Approved jacking devices shall be employed as required.
- G. Cast iron pipe shall be used for a distance of 10-feet on either side of a crossing of an existing water main, when the sewer line is less than 3-feet below the water main.

3.5 MAXIMUM ALLOWABLE JOINT DEFLECTION:

- A. No vertical nor horizontal deflections in excess of pipe manufacturer's recommendations for any type pipe material shall be allowed.

3.6 SERVICE TEES AND WYES:

- A. Service tees and wyes shall be installed in accordance with the recommendations of the manufacturer and as shown on the Standard Details bound herewith.

3.7 DISSIMILAR PIPE CONNECTIONS:

- A. Install Romac or Fernco couplers when connecting two pipes of differing materials, and outside diameters, in accordance with the manufacturers directions.
- B. Concrete closures collars shall be used only when approved, and then only to make connections between dissimilar pipe or where Romac and Fernco joints are impractical. The collars shall be placed using an approved commercial concrete bonding agent applied to all surfaces in contact with the collar. Where concrete closure collars are necessary to join PVC pipe, the PVC surface shall first be prepared for bonding to the concrete by applying a dense coating of clean mortar sand to the pipe using PVC solvent cement. After the cement has cured, an approved commercial concrete bonding agent shall be applied to the surface prior to placement of the concrete.

3.8 MARKERS:

- A. In new subdivisions and undeveloped areas, after the service line pipe is installed, block the capped or plugged end and install 2 x 4 marker. Extend markers at least 36-inches above the ground surface. The lower end of the marker shall be placed above the plugged end of the pipe to prevent damage to the sewer. Paint the top portion of the marker after its installation with first-quality white, quick-drying enamel. After the paint has dried, use black, quick-drying enamel and neatly indicate the distance from the natural ground surface to the top of the service line pipe in feet and tenths of feet.
- B. Take precautions during the backfilling operation to ensure the position and location of the marker. If the marker is broken or knocked out of vertical alignment during the backfilling operation, reopen the trench and replace the marker. Omit markers in developed areas where installing the marker is not feasible, as determined by the Engineer.

3.9 CLEANING OF SEWER SYSTEMS:

- A. Before final acceptance of the completed sewer line, the entire system shall be flushed and cleaned with water. This does not apply to the service laterals. The solid debris material obtained from flushing and cleaning shall not be allowed to enter any existing sewer system.

3.10 BY-PASS PUMPING:

- A. In the event that project requirements are for installing and/or replacement of an existing system the Contractor shall provide for by-pass pumping around the work limits so as not to inhibit service to customers.
- B. Contractor shall furnish all equipment, labor and materials to place by-pass pumping into operation for sewer mains and service connections.
- C. Equipment shall be approved by the Engineer to be of size and type capable of adequately handling bypassing requirements.

3.11 ELECTRIC LOCATOR:

- A. Non-metallic pipe shall be constructed with an electrically conductive tracer wire, 12-gauge, insulated copper, green shielding (insulation THHX) installed above the zenith of the pipeline and terminating at the MH with a 12-inch, min., coil.

3.12 CONNECTION TO EXISTING DRAINAGE STRUCTURE:

- A. Connections to MHs or CBs or other concrete structures with PVC pipe shall be made with sand collars and grouted watertight. Other connections to existing pipes via concrete closure collars or Fernco or Romac as directed by the Engineer.

3.13 MEASUREMENT AND PAYMENT:

- A. **PIPE:** Pipe will be measured and paid for on a lineal foot basis, to the nearest 0.1-foot, for the types and sizes listed in the bid schedule. No reduction in length will be made for valves and fittings.
- B. **FITTINGS:** No separate payment will be made for fittings and are incidental to the unit price for pipe.
- C. **THRUST BLOCKS:** Thrust blocks will be measured and paid for at the unit price per each listed in the bid schedule.
- D. **SERVICE LINES:** Service lines shall be measured and paid at the unit price to the nearest 0.1 lineal foot for each diameter as listed in the bid schedule.
- E. **BY-PASS PUMPING:** BPP shall be paid for at the unit price as scheduled in the Bid.
- F. **EXISTING CONNECTIONS:** Connections shall be paid at the unit price established in the bid

and as field measured for work accomplished.

PART 4 TESTING

4.1 GENERAL:

- A. Storm Drain lines will not be tested for infiltration and leakage unless specified on the drawings.
- B. When quality of material and/or workmanship is in doubt for any reason, the Engineer may require the storm drain and all applicable appurtenances to be tested. When so ordered, the storm drain shall be required to pass the same air test specified for sanitary sewers.

4.2 TELEVISION INSPECTION:

- A. At the discretion of the Engineer, the City may, at no expense to the Contractor, make a televised inspection of the storm drain pipe. Any defects in material or workmanship or grade shall be satisfactorily corrected prior to final acceptance of the work.

END OF SECTION