SECTION 02540
SANITARY SEWER POINT REPAIRS

PART I: GENERAL

1.1 GENERAL REQUIREMENTS
- A. Repair and replacement of sanitary sewer line failures.

1.2 MEASUREMENT AND PAYMENT
- A. Unit Prices:
  1. Payment for point repairs shall be on a unit price basis for each repair. Payment shall be made for each repair complete in place, including all materials equipment, labor and excavation and backfill.
  2. Payment for point repairs shall be on a unit price basis per linear foot of repair as measured along the centerline of the sanitary sewer line. Payment shall be made for each repair complete in place, including all materials equipment, labor and excavation and backfill.
  3. No separate payment shall be made for Television Inspection of repaired sanitary sewer lines.
  4. Refer to Section 01270 – Measurement and Payment for unit price procedures.
- B. Stipulated Price (Lump Sum):
  1. If contract is Stipulated Price Contract, payment for work in this Section is included in the Total Stipulated Price.

1.3 REFERENCES
- A. ASTM – American Society for Testing and Materials.
  1. ASTM C150 – Standard Specification for Portland Cement.
  2. ASTM D698 – Standard Test Methods for Laboratory Characteristics of Soil Using Standard Effort.
- B. CFSD – City of Friendswood Standard Details.
- C. CFTS – City of Friendswood Technical Specifications.

1.4 SUBMITTALS
- A. Conform to requirements of Section 01330 – Submittal Procedures.
- B. Submit product data for each pipe product, fitting, coupling and adapter.

1.5 QUALITY ASSURANCE
- A. Provide manufacturer's affidavits that pipes, fittings, couplings and adapters were manufactured in compliance with standards and Technical Specifications referenced in this Section.

PART II: PRODUCTS

2.1 MATERIALS

A. Use only soils that are in compliance with the specifications in Section 02140 – Utility Backfill Materials.

B. Use cement-stabilized backfill for bedding and backfill to above the pipe as required. Repairs under paving shall have cement-stabilized backfill to the top of the subgrade of the paving that shall conform to Section 02145 – Cement-Stabilized Sand.

1. Cement shall consist of Type I Portland Cement conforming to ASTM C150.
2. Sand and cement shall be mixed in a pug mill or obtained from an approved supplier using not less that one and one-half (1-1/2) sacks of cement per one ton (1 Tn) of mixture and sufficient water to hydrate the cement.

C. All pipe and materials for repair shall conform to the appropriate section, Section 02200 to Section 02280, for the type of pipe being repaired.

PART III: EXECUTION

3.1 PREPARATION

A. All line materials (pipe and fittings) shall be on-site prior to any excavation.

B. Bedding material shall be on-site or delivery arrangements definitely made with a reliable source.

C. Trench Safety Systems shall be on-site and shall comply with all rules, regulations and laws as specified in Section 02280 – Trench Safety Systems.

D. Provide bypass pumping as required. Bypass pumping shall be incidental to the work in this Section. All bypass pumping shall conform to Section 02555 – Sanitary Sewer Bypass Pumping.

3.2 EXCAVATION

A. Trenching and Excavations shall comply with Section 02125 – Excavation and Back Fill for Utilities.

B. Trench sides shall be as near vertical as practical considering wall stability and safety. Remove and dispose of defective pipe. Correct trench grade as required and stabilize trench with cement-stabilized sand. Backfill to above top of new pipe as specified in the City of Friendswood Standard Details.

C. Excavated material suitable for backfilling, and meeting specifications of Section 02140 – Utility Backfill Material, shall be piled as far as practical from edge of trench, to increase soil stability and allow working room for pipe removal and pipe laying operations. Excess material is to be removed from the trench bank as soon as possible. Excess material becomes the Contractor's property and it is the Contractor's responsibility to dispose off waste material as specified in Section 01580

– Waste Material Disposal.

D. It is the Contractor's responsibility to maintain safe conditions and follow all local, state and federal guidelines for trench safety and Section 02280 – Trench Safety Systems. The Contractor shall have a person competent in trench safety or safety officer on site at all times during excavation.

3.3 TRENCH WATER

A. Where practical, ground surfaces shall be graded or diked to prevent the entry of surface water into the open trench.

B. Groundwater entering the open trench from the walls and from a firm bottom in small quantities shall be promptly removed by trench pumps. Multiple pumps in good operating order shall be kept on the excavation site for such purposes at all times. Under such trench conditions, the rough excavation of grades is required to drain water to the pumps prior to under-bedding placement, and with suitable screening to exclude sand from pump suction.

Other methods may be employed by the Contractor to achieve the required results only after such methods submitted to and approved by the Project Manager. The water level shall be maintained below the pipe invert until full compaction of the pipe bedding has been accomplished.

C. In the event that trench pumps are unable to maintain the required level of water, or, if the water entry is from the bottom of the excavation in such quantities as to make the bottom unstable, or, from the sides in such quantities to make the walls unstable, then the Contractor shall provide and operate an effective well point system to dewater the trench for the required pipe laying conditions.

D. Water removed from trenches, from drainage ditches and well points shall be conveyed to the City's drainage system, upstream of erosion control devices. Pumped water shall not be discharged onto the streets, sidewalks or private property.

E. Dewatering or well pointing systems shall be installed and operated so as to minimize inconvenience and annoyance to the public. Mechanical equipment shall be housed or shielded to minimize noise; engines are to be provided with efficient noise mufflers. Points and headers shall not block pedestrian and vehicular traffic. Location of pumping units shall be chosen for minimum disturbance. Site to be promptly restored to its original or better condition after well point removal.

3.4 PIPE EMBEDMENT

A. After defective pipe is removed, cut or fill trench to rough grade. All fill shall be cement-stabilized sand per Part II – Products, of this Section. Place embedment across the width of the trench and approximately to the grade of the bottom of the pipe, with bell hole left open and additional material on the sides. Additional dry, loose material is to be placed in uniformly spaced piles along the pipe (clearing sling points, if any, and

bell holes) sufficient to support the lower quadrant of the pipe barrel for thirty percent (30%) or more of its length. The spigot end of pipe is to be set into the receiving bell and lowered against sand. It is to be checked for vertical alignment of spigot vs. bell and for grade. The length is to be worked into true alignment and grade by "bumping", and/or adding or removing underbedment material, so pipe piece is uniformly supported, under its own weight, for the lower quadrant for not less that eighty percent (80%) of its length. The pipe piece is then moved horizontally (axially) to make up the joint and additional underbedment material promptly worked under the pipe and tamped to provide full support for its lower one-third (1/3) for its entire length. Joint is to be checked for make-up and exterior protection placement commenced. Pipe bedding material placement shall continue and pipe shall be solidly anchored against axial movement before the next joint is made-up. Remaining bedding and backfill placing shall continue until complete. Trench water shall not rise appreciably until the bedding level is above spring line of pipe.

3.5 BACKFILL

A. Where excavation has resulted in clods not larger than ten inches (10 In) in the largest dimension, the surface excavated material shall be pushed into the trench in layers not thicker than twelve inches (12 In) and compacted. Where excavation has resulted in clods larger than ten inches (10 In) in the largest dimension, then follow this procedure as approved by the Project Manager:
   1. The clods are to be removed from the trench area and select imported fill material substituted therefore, or
   2. The clods are to be reduced to not greater than allowed above and adequate finer materials sufficient to fill voids between large clods provided. Highly-organic excavated material shall be considered "unsuitable" and excluded from backfill.

B. Each layer of the backfill is to be mechanically compacted, to densities per ASTM D698 (standard proctor) within plus or minus three percent (±3%) optimum moistures content. Reopen trenches and backfill that does not meet specifications and recompact.

C. Backfill shall be hand-placed and compacted under lines crossing the trench, steep slopes, valves, valve boxes, service connections, manholes, inlets and other appurtenances and structures.

D. Any trench settlement shall be promptly filled, all trenches to be given final dressing immediately after settlement.

E. Final clean-up to follow backfill operation within forty-eight hours (48 Hrs) of construction or earlier if directed by the Project Manager.

3.6 Miscellaneous Precautions and Restoration of Damages.

A. The Contractor shall at all times be vigilant in observing overhead electric power and communication equipment.

B. Damage to overhanging tree limbs shall also be avoided. Damage limbs

should be pruned accordingly.

C. All existing facilities (fences, structures, pavements, driveways, sidewalks, trees, gardens, etc.) damaged or removed to facilitate the point repairs shall be restored to as good as or better condition. All cost shall be borne by the Contractor.

END OF SECTION