

SECTION 02200

EXCAVATION AND BACKFILL

PART 1 - EXCAVATION

1.01 GENERAL

- A. The Contractor shall keep the excavation as small as needed to complete the work, and shall avoid undermining pavement, curbs and sidewalk. If sidewalks, curbs or pavements are undermined, they shall be removed and replaced or backfilled with controlled low strength material, as per Part 2.02 of this Section.
- B. Excavated material may be stored on site until the work is completed, up to a maximum of seven (7) days. The stored material shall not block pedestrian or vehicle traffic and shall be protected with safety markers and barricades. If the material is stored on a permanent ROW structure, the Contractor shall provide adequate protection to such structures. For large excavations, the excavated material shall be hauled away as the material is excavated. All excess excavated material shall be the responsibility of the Contractor and properly disposed of at an offsite location.
- C. The Contractor may use an underground sleeve as long as the sleeve is left in place and the method is approved by the Engineer. If the sleeve is removed and it undermines a permanent ROW structure, the cavity must be backfilled with controlled low strength material, as per Part 2.02 of this Section.
- D. Excavations shall be adequately braced to prevent damage to the pipe or structure being constructed or to adjacent structures, utilities, pavements or injury to workmen or others through movement of the adjacent earth banks. The United States Department of Labor, Occupational Safety and Health Administration (OSHA), Construction Industry Code relating to excavation, shoring and bracing shall be made a part of this specification. Any damage resulting from lack of adequate bracing shall be the responsibility of the Contractor. The Contractor shall affect all necessary repairs or reconstruction at his own expense and shall bear all other expense resulting from such damage.

1.02 EXCAVATION FOR PIPE

- A. Excavation for pipe lines shall follow lines parallel to and equidistant from the location of the pipe centerline. Trenches shall be excavated to the depths and widths as shown on plan or as approved by the Engineer. Trenches must be of sufficient width to permit proper jointing of the pipe and inspection of the work.
- B. The bottom of the trench shall conform to the final grade of the pipe and shall be so shaped that the pipe will rest upon earth for its entire length. Where rock or water-saturated earth is encountered, mechanical excavation may extend to a depth of at least

six (6) inches below the bottom of the pipe. A bedding of No. 1 stone shall then be provided as per Article 2.01 - BACKFILL AT PIPE ZONE of this Section. Unauthorized excavation below grade shall be filled with compacted gravel or bedding stone at no additional cost to the Department of Public Works. A concrete cradle may be required as determined by the Engineer. Trenches shall be kept free of water and super-saturated soil.

- C. The length of trench that may be opened at any time in advance of the pipe laying shall be determined by the Engineer. All excess excavated material shall be the responsibility of the Contractor and properly disposed of at an offsite location.

1.03 EXCAVATION FOR STRUCTURES

- A. All manholes and other structures shall be constructed on and shall be in direct contact with undisturbed original subsoil. All unauthorized excavation below the specified structure subgrade shall be replaced with a bedding of No. 1 stone as per Article 2.01 - BACKFILL AT PIPE ZONE of this Section, at the Contractor's expense.
- B. All excavations shall be kept dry. No water shall be permitted to come in contact with any concrete within twelve (12) hours after placement. Subgrade soil for all structures shall be firm, dense and consolidated, shall be free from mud and muck and shall be sufficiently stable to remain firm and intact under the feet of the workmen engaged in subgrade surfacing. Where unsuitable subgrade soil is encountered, a layer of concrete, course gravel or crushed stone may be used for subsoil reinforcement. Shoring and bracing must be furnished when necessary.
- C. The excavation for all structures shall be made to the lines and grades as shown on the plan or as directed by the Engineer. All excess excavated material shall be the responsibility of the Contractor and properly disposed of at an offsite location.

1.04 UNCLASSIFIED EXCAVATION

The grading and preparation of subgrade for pavement foundations, curb, gutter and sidewalks, shall conform to these specifications. It shall consist of excavating all earth, old concrete and any other material encountered relative to the required construction. The extent of excavation shall be according to plan or as directed by the Engineer. Should the Contractor cut below true subgrade, he will be required to re-establish subgrade, in accordance with Part 2 of this Section at no additional cost to the City.

1.05 BLASTING

Blasting will not be allowed except by written permission from the Director of Public Works.

PART 2 - BACKFILL

2.01 BACKFILL AT PIPE ZONE

Washed stone, equal to NYSDOT Standard Specifications Table 703-4 "Sizes of Stone, Gravel and Slag", No. 1, with 100% passing 1 inch sieve, shall be deposited in the trench simultaneously on both sides of the pipe for the full width of the trench, in even layers and to a maximum elevation of one (1) foot above the top of the pipe.

2.02 BACKFILL UNDER SIDEWALKS, CURBS AND STREET PAVEMENT

- A. Gravel Backfill - Trenches or utility cuts shall be backfilled with an approved screened gravel. The screened gravel shall meet the requirements of Item 304.12 "Subbase Course, Type 2" of the New York State Department of Transportation Standard Specifications. The gravel shall be placed in layers of not more than one (1) foot and mechanically compacted by an approved method to 95% of standard proctor density.

Dumping of gravel directly from trucks into the trench without compaction will not be allowed. Trench flooding as an alternate means of tamping will not be permitted unless specifically approved by the Engineer.

- B. Controlled Low Strength Material (CLSM) - Trenches or utility cuts may be backfilled using controlled low strength material, Item 204.02 "Controlled Low Strength Material (CLSM) (No Fly Ash)" instead of gravel. CLMS must be used (1) when ROW structures or pavements were undermined during excavation, (2) to fill cavities beneath structures (3) when ordered by the Engineer.

The mortar mix shall flow easily and spread to all parts of the excavation (3" x 6" cylinder volume shall spread at least 8 inches in diameter on a flat, smooth surface.) It shall yield a compressive strength greater than 75 psi but less than 200 psi and shall be used within 2.5 hours from mixing. The mix shall not be placed on frozen ground and shall not be subject to loads for at least 24 hours after placement.

- C. Excavated material may be used as backfill material when, in the opinion of the Engineer, the material is suitable for such purpose. In cases where excavated material is not satisfactory for backfilling, the Contractor will be required to use imported gravel or controlled low strength material fill for backfilling as called for in Paragraphs A and B above.

2.03 BACKFILL IN TERRACE AREA

- A. Terrace Area (between curb and property line) - The Contractor may backfill with the material removed during excavation providing that the trench is not within one (1) foot in any direction of a sidewalk, drive approach or curb. No stone larger than eight (8) inches in its greatest dimension shall be used in the backfilling. The material shall not be allowed to slough under curb, sidewalk or pavement. If the utility trench is within one foot of the sidewalk or curb and/or is parallel to the sidewalk or curb, all excavated

material must be hauled away and the trench must be backfilled as per the requirements of Section 2.02 above.

2.03 BACKFILL DEFICIENCY

Any deficiency in the quantity of material for backfilling trenches or for filling a depression caused by backfill settlement shall be supplied and placed by the contractor responsible for the original excavation and backfilling operation. Material used shall meet the approval of the Engineer.

2.04 BACKFILL OF ABANDONED PIPES

- A. An abandoned underground, gravity-flow pipe which is left in-place shall be completely filled with controlled low strength material (CLSM), as specified in Paragraph 2.02B above. The down gradient end of the pipe shall be plugged with mortar and allowed to cure. The CLSM shall then be placed in the opposite end of the pipe in a manner which fills the entire diameter of pipe with the CLSM.
- B. Underground pressure-flow pipes which are abandoned shall be excavated and removed, as determined by the Engineer.

END OF SECTION