SECTION 3725 - TRENCH EXCAVATION FOR SEWER FORCE MAINS

PART 1 - GENERAL

1.1 SCOPE OF WORK:

Provide all labor, materials, equipment and services required for pipeline trench excavation.

PART 2 - EXECUTION

2.1 EXCAVATION FOR PIPELINE TRENCHES:

A. Trenching shall be accomplished in accordance with these specifications and the Standard Details.

B. Unless otherwise shown on the plans or directed by the ENGINEER, trenches in which pipes are to be laid shall be excavated by open cut method to the depths shown on the plans, the cut sheets, or as specified by the Engineer. In general this shall be interpreted to mean that machine excavation shall not extend below an elevation permitting the pipe to be bedded as required by Section 3735.

C. Care of Surface Material for Reuse - All surface materials that, in the opinion of the ENGINEER, are suitable for reuse in restoring the surface shall be kept separate from the general excavation material, as directed by the ENGINEER.

2.2 EXCAVATION AND PREPARATION OF TRENCH:

A. Description - The trench shall be dug so that the pipe can be laid to the alignment and depth required, and it shall be excavated only so far in advance of pipe laying as is necessary to maintain continuous work by the laying crew through the working day. Open trench ahead of pipe laying shall be kept to a minimum and shall not be in excess of 25 feet at the end of the working day or at time of ceasing work due to weather or other foreseeable causes. The trench shall be so braced and drained that the workmen may work in it safely and efficiently. It is essential that the discharge of the trench dewatering pumps be conducted to natural drainage channels, drains or storm sewers.

B. Width of Trench - The width of the trench shall be ample to permit the pipe to be laid and joined properly, and the backfill to be placed and compacted as specified hereinafter. Trenches shall be of such extra width, when required, as will permit the convenient placing of timber supports, sheeting and bracing, trench boxes, and handling of specials.

C. The trench shall be straight and uniform so as to permit laying pipe to lines and grades given by the ENGINEER. It shall be kept free of water during the laying of the pipe and until the pipeline has been backfilled. Removal of water shall be at the CONTRACTOR's expense.

D. Bell Holes - Bell holes shall be provided at each joint to permit the joint to be made properly, and the pipe to be supported along its full length by the trench bottom. Allowing the pipe to be “bridged” by the bell is not acceptable.

E. Pipe Clearance in Rocks - Ledge rock, boulders, and large stones shall be removed to provide a clearance of at least 6 inches on all sides of all pipe, valves, and fittings for pipes 24 inches in diameter or less, and 9 inches for pipes larger than 24 inches in diameter.

The specified minimum clearances are the minimum clear distance that will be permitted between any part of the pipe and appurtenances being laid and any part, projection, or point of such rock, boulder, or stone.

F. Excavation Below Grade - Where the trench must be excavated to 6 inches below the specified grade, and before the pipe is laid, the subgrade shall be made by placing bedding as per Section 3735. The layers shall be thoroughly tamped as directed by the ENGINEER so as to provide a uniform and continuous bearing and support for the pipe at every point between pipe bells, except that it will be permissible to disturb and otherwise damage the finished surface over a maximum length of 18 inches

near the middle of each length of pipe by the withdrawal of pipe slings or other lifting tackle. The finished subgrade shall be prepared accurately by means of hand tools. The subgrade beneath the centerline of the pipe shall be finished to within 0.08 feet of a straight line between pipe joints.

G. Excavation in Poor Soil and Refilling to Grade - In wet, yielding mucky locations or other locations where the bottom of the trench at subgrade is found to be unstable or to include ashes, cinders, refuse, vegetable or other organic material, or large pieces or fragments of inorganic material that in the judgement of the ENGINEER should be removed, the CONTRACTOR shall excavate, remove and dispose of such unsuitable material to the width and depth ordered by the ENGINEER. The excavated unsuitable material shall be replaced with Foundation Aggregate, AASHTO M-43 Size No. 2, 24, or 3 to a level that is 6" below the bottom of the pipe barrel in order to form a suitable foundation for the pipe bedding material. Geotextile filter fabric shall be placed between the native soils and the Foundation Aggregate. Before the pipe is laid, granular bedding shall be placed as specified.

H. Special Foundation in Poor Soil - Where the bottom of the trench at subgrade is found to consist of material that is unstable to such a degree that, in the opinion of the ENGINEER, it cannot be removed and replaced with an approved material thoroughly compacted in place to support the pipe properly, the CONTRACTOR shall construct a foundation for the pipe, consisting of piling, treated timbers, concrete, or other materials, in accordance with plans prepared by the ENGINEER. Extra compensation will be allowed for the additional work.

I. Subgrade in Rock Trenches - Where excavation is made in rock or boulders and the clearance specified in Paragraph 2.2.E is provided, the subgrade shall be made as specified in Paragraph 2.2.F before the pipe is laid.

J. Blasting - Blasting for excavation will be permitted only after securing the approval of the ENGINEER and only when proper precautions are taken for the protection of persons or property. The hours of blasting shall be fixed by the ENGINEER. Any damage caused by blasting shall be repaired by the CONTRACTOR at his expense. The CONTRACTOR's methods of procedure in blasting shall conform to state laws and municipal ordinances.

K. Trenching by Hand or Machine - Hand methods for excavation shall be employed in locations shown on the drawings. In other locations the CONTRACTOR may use trench digging machinery or employ hand methods.

2.3 SAFETY AND UTILITY PROVISIONS

A. Braced and Sheeted Trenches - Open cut trenches shall be sheeted and braced as required by OSHA or any governing state laws and municipal ordinances, and as may be necessary to protect life, property, the work, or as ordered by the ENGINEER.

B. Piling of Excavated Material - All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants under pressure, valve pit covers, valve boxes, curb stop boxes, manhole covers, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until during the work. Gutters shall be kept clear or other satisfactory provision made for street drainage, and natural watercourses shall not be obstructed.

C. Barricades, Guards and Safety Provisions - To protect persons from injury and to avoid property damage, adequate barricades, construction signs, torches, red lanterns, and guards as required shall be placed and maintained during the progress of the construction work and until it is safe for traffic to use the highway.

All material piles, equipment, and pipe that may be obstructions to traffic shall be enclosed by fences or barricades and shall be protected by proper lights when the visibility is poor. Safety rules and regulations of local authorities shall be observed.

D. Structure Protection - Temporary support, adequate protection and maintenance of all underground and surface structures, drains, sewers and other obstructions encountered in the progress of the work shall be furnished by the CONTRACTOR at his expense and under the direction of the ENGINEER. Any

structures that have been disturbed shall be restored upon completion of the work.

E. Protection of Surface Structures - Trees, shrubbery, fences, poles, and all other property and surface structures shall be protected unless their removal is shown on the drawings or authorized by the ENGINEER. When it is necessary to cut roots and tree branches, such cutting shall be done under the supervision and direction of the ENGINEER.

F. Interruption of Service - NO valve or other control on the existing system shall be operated for any purpose by the CONTRACTOR. The OWNER will operate all valves, hydrants, blow-offs, and curb stops.

G. All excavated materials shall be placed a minimum of 2 feet back from the edge of the trench.

2.4 BACKFILLING AND COVER

A. Backfilling shall be as required in Section 3735.

B. A minimum cover of 48 inches shall be provided for all sewer force mains, unless otherwise indicated in the plans or specifications.

PART 3 - BASIS OF PAYMENT

1. Trench excavation is not a pay item. It is included in the pipeline's overall unit cost. There shall be no extra payment for excavation, no matter what soil types or conditions are encountered (no extra payment for rock excavation, pumping of groundwater, etc.). If soil boring information is not included in the bid documents, the CONTRACTOR shall make his own subsurface investigations as necessary prior to submitting a bid to determine soil and groundwater conditions. This shall be coordinated with the Butler County Department of Environmental Services, Butler County Engineer's Office, ODOT, all property owners, the Ohio Utilities Protection Service, and all other appropriate agencies.

2. The volume of Foundation Aggregate for payment shall be computed by multiplying the length of the trench as measured along the centerline of the pipe, times the actual width of the trench at the top of the pipe barrel (but not to exceed the outside diameter of the pipe barrel plus 18 inches) times the depth of the excavation necessary, as determined by the ENGINEER, below the specified depth. Payment for Foundation Aggregate will be made at the unit price bid per cubic yard for the quantities as determined from the measurements specified above. No payment will be made where Foundation Aggregate is required due to over-excavation by the CONTRACTOR no ordered by the ENGINEER. Cost of geotextile filter fabric shall be included in the bid price for Foundation Aggregate.

END OF SECTION