

SECTION 338000 – TRENCHING AND BACKFILLING

PART 1 - GENERAL

1.1 EXTENT OF WORK

- A. Work under this Section includes all grading, trenching, excavation, and backfilling required to complete the project. Bedding of the pipe shall be as specified in Section 338100 “Pipe Bedding”.
- B. **All Earthwork shall be unclassified. There shall be no additional payment to the Contractor for any rock excavation required for the successful installation of the project.**

PART 2 - DETAIL REQUIREMENTS

2.1 TRENCHING AND EXCAVATION

- A. All trenching and excavation shall be made to the dimension and depth indicated with proper allowance for space in which to install the necessary work, including such bracing and supporting of the trench banks as may be necessary.
- B. All trenches and excavations shall be kept dry at all times. Should water enter the trenches or excavations all work within such areas shall cease until after the water has been disposed of, unless otherwise directed by the A-E. Contractor shall, at his expense, provide the necessary means for maintaining dry trenches and excavations, including pumps, well-points, or other mechanical equipment suitable for the actual field conditions encountered. No masonry shall be laid in water and water shall not be allowed to rise over masonry until the mortar has set at least 36 hours. All water pumped or drained from the work shall be disposed of in a suitable manner without damage to adjacent property or to other work under construction.
- C. Where sheeting is installed to maintain the trench banks, no part of the sheeting below the top of the pipe shall be removed. Whenever sheeting is installed to maintain trench banks in water-bearing soil, the sheeting shall not be removed from a level 4’ above the top of the pipe, or 1’ below finish grade, whichever is the lower.
- D. Except as otherwise indicated or specified, all trenches shall be excavated in open cut from the surface to the lines and grades indicated and established by the Contractor from the information shown on the drawings.
- E. Width of the trench at the top of the pipe shall not be wider than the outside diameter of the pipe plus 24” except for additional width required to accommodate trench box. Limits of trench widths at top of pipe shall be strictly adhered to, and where width of trench at the top of the pipe exceeds the width specified, the Contractor, at his expense, shall provide additional pipe bedding as directed by the A-E including concrete cradle or concrete casing as required. See Section 338100 “Pipe Bedding”.

- F. Rock shall be excavated a minimum of 6” below the bottom of the pipe. If pipe with bells is used, excavation at these points shall be carried 6” below the bells and of sufficient length to enable the Contractor to make up the pipe joint. This extra depth of excavation shall then be backfilled with suitable earth materials and thoroughly tamped to pipe grade.
- G. All blasting operations shall be conducted in strict accordance with existing laws, rules and regulations relative to the storage and use of explosives. Blasting shall be done only by experienced men working according to accepted practice, and extreme care shall be exercised by the Contractor to prevent injury to any existing pipes, water lines, gas mains, poles, wires, cables, drains, buildings or other structures or utilities either below or above the surface of the ground. Any injury which may be caused shall be the responsibility of the Contractor. Where there is any possibility of damage being caused by blasting it may be necessary to resort to drilling and wedging to remove the rock.
- H. The Contractor will be held strictly responsible for any and all injuries to public and private property or persons.
- I. Excess excavation or material not suitable for backfill shall be removed by the Contractor. Rock shall be removed from the property and streets. Disposal of excess material and rock shall be the responsibility of the Contractor. No additional payment will be made for disposal.
- J. Excavation, backfill and pipe work under highways or streets maintained by the N.C. Department of Transportation shall be done in accordance with these specifications and the Department of Transportation’s requirements. Upon completion of such work the Contractor shall present to the A-E, certificates in triplicate from the Department of Transportation that the work has been done in accordance with their requirements and is acceptable to them.
- K. Excavation, trenching, backfill, and pipe work within the rights-of-way of public and/or private utility companies or public carriers shall be done in accordance with these Specifications and the requirements of the particular company involved. The Contractor shall make all arrangements and pay all cost charged by the utility company for protection of and/or the relocation of the existing improvement required by the work performed under this Contract. This includes any cost that the public and/or private utility company or public carriers may charge to have their own representative on site during construction by the Contractor that is adjacent to their utility. Upon completion of such work the Contractor shall present to the A-E certificates in triplicate from each utility or carrier company involved that the work has been done in accordance with their requirements, that all cost charged by them has been paid, and that the work is acceptable to them.
- L. Cost of all materials and construction methods, such as concrete casing, stone stabilizer, etc., required by the N.C. Department of Transportation or public and/or private utility companies, for the work within their respective rights-of-way shall be included in the unit price bid. No adjustment will be made to the Contract price for such items used in the work unless the items are specifically ordered by the A-E.

2.2 TRENCH BOTTOMS

- A. The trench bottoms shall be prepared to receive the pipe in accordance with Section 338100 “Pipe Bedding”.

2.3 BACKFILLING

- A. All excavations shall be backfilled to the original grade, except at locations where original grade would result in less than a minimum of 2' of cover over the top of the bell of the pipe, as specified herein or as directed by the A-E. Where original grade would result in less than a minimum of 2' of cover over the top of the bell of the pipe, additional backfill shall be accomplished to the typical outline shown on the drawings.
- B. Except where special pipe bedding material is required, material used for backfill under, around and over sewer pipes to a depth of 2' above the top of the barrel of the pipe shall be clay, sand or other earth which is free of rock over 2" in largest dimension, cinders, broken concrete, or roots, stumps, timber or other objectionable foreign matter. This material shall be placed in uniform layers not exceeding 6" in thickness with each layer thoroughly compacted by mechanical tamping. Special care shall be exercised in tamping the backfill under the pipe to secure solid bearing for the pipe, being careful, however, not to disturb the alignment or grade of the pipe or the pipe joints. Backfill from 2' above the top of the pipe to the top of the trench or finished grade shall be made in layers not over 6" in thickness. Rock not exceeding 4" maximum diameter in volume may be included in this part of the backfill provided that sufficient earth is included to make a compact mass. Each 6" layer shall be compacted by mechanical tampers. Heavy rollers, vehicles, or other equipment shall not be used for compacting backfill nor be allowed to cross over completed work except at crossing points prepared by the Contractor and approved by the A-E. The top of the backfill shall be carried above the surrounding grade so that upon subsequent settlement, the backfill will be at the proper elevation. Backfill flooding will not be acceptable in lieu of compaction as specified but may be required in addition to the specified compaction. The Contractor shall maintain the backfill of all parts of the work until completion of the guarantee period of the Contract. Should settlement of backfill occur during this period, the Contractor shall add sufficient backfill to bring it up to finished grade.
- C. Material backfilled in trenches shall be placed in uniform layers not exceeding 6" in thickness with each layer thoroughly compacted by mechanical tamping to 95 percent of Standard Proctor AASHTO-T99 density. Backfill under structures shall be compacted to 98 percent of Standard Proctor Density. The top 6-inches of trenches shall be compacted to 100 percent Standard Proctor Density. Backfill in the roadways shall be tamped to NCDOT requirements.
- D. Excavated space for manholes, wet wells, piers and similar structures shall be free of all debris prior to placing backfill. Remove all concrete forms. Place backfill in 6" thick layers and thoroughly compact each layer with mechanical tampers as necessary to prevent subsequent settlement. Extend backfill to indicated finish grade.
- E. Equipment for compaction backfill in trenches and excavations shall be especially selected for the type of material used in the backfill. Generally, vibrating type equipment shall be utilized for non-cohesive soils and impact type equipment shall be used for cohesive soils.

2.4 CUTTING AND REPLACEMENT OF PAVING

- A. All pavement cuts shall be 12" wider on each side of the ditch than the earth cut at the top of the ditch, to provide extra bearing for the replaced pavement. Pavement replaced shall be the same material and shall be 1" thicker than the adjacent existing pavement. Pavement replacement in State highways or County roads shall be done in accordance with these specifications and the

requirements of the N.C. Department of Transportation. All pavement replacement will be paid for by the contractor at his own expense. Should any repairs to the pavement be necessary during the guarantee period, the work shall be performed by the Contractor at his own expense.

END OF SECTION 338000