

DIVISION 3
EARTHWORK

3-1 General

- A. The Contractor shall provide all labor, materials, equipment and services necessary for executing all earthwork operations in the preparation of subgrade for structures and pavements. The Contractor is responsible for all excavation, compaction, furnishing and installing backfill material, and all other related items as shown on the drawings and/or as specified herein.
- B. Definitions
- 1) Class 1 Excavation: Class 1 Excavation is defined in accordance with the Anne Arundel County Standard Specifications for Construction, January 2001 or latest edition, Section 02210.D-5. Furthermore, Class 1 Excavation will include the removal of all earth, asphalt, concrete, pavement (any type), driveway aprons, granite paving blocks, bricks, concrete curb and gutter, asphalt curb, gutter, sidewalk (any type) and any other material required to complete the work.
 - 2) Class 1-A Excavation: Class 1-A Excavation is defined in accordance with the Anne Arundel County Standard Specifications for Construction, January 2001 or latest edition, Section 02210.E-1. Furthermore, Class 1-A Excavation shall consist of such excavation as the Owner or Owner's Representative may order below the limits of Class 1 excavation for the removal of unsuitable materials.
 - 3) Backfill: Backfill required for undercut areas shall be defined, in this Section only, as material that meets the product requirements of Structural Fill provided in this Section. Imported structural fill will only be used upon the authorization of the Owner or Owner's Representative.
 - 4) Subgrade: This item shall mean the bottom of aggregate base materials under structures, utilities, and pavements. In areas where aggregate base materials are not specified, subgrade shall mean the bottom of the topsoil or surface treatment, whichever is lower.
 - 5) Upland: Any work or disturbance immediately landward of the revetment, bulkhead or above Mean High Water (MHW) as shown on the Contract Drawings.
- C. Work shall consist of, but not be limited to, preliminary rough grading; stripping of topsoil; excavation, bedding; providing off-site borrow; removal from the site of unsuitable soil materials; soils testing and certification; rough grading, fill and backfilling for embankment stabilization, structure subgrades, finish grading of subgrades, and dewatering. Erosion control measures are included as part of this work.
- D. All excavation, fill, bedding and backfill work provided under other sections of these specifications shall conform to requirements of this Section. All backfill, embankments and subgrade where pavement or other structures are proposed shall be tested and certified by the Contractor's soils testing agency provided as work of this Section.
- E. Testing and Soils Testing Agency
- 1) Contractor will engage a professional geotechnical firm for quality control testing and inspection during earthwork operations. Cost of testing and inspection shall be borne by the Contractor.
 - 2) The geotechnical engineer shall provide its professional opinion, by letter, sealed and signed by a professional engineer registered in the State of Maryland, that the earthwork has been completed in accordance with the plans and specifications.

- F. **Submittals**
Submit the following reports directly to the Owner or Owner's Representative from the soils testing agency with copy to Contractor:
- 1) Test reports on borrow material.
 - 2) Field density test reports.
 - 3) One optimum moisture-maximum density curve for each type of soil encountered as a minimum.
- G. The Contractor shall notify the Owner or Owner's Representative and Miss Utility forty-eight (48) hours prior to the start of earth moving activities. He shall locate existing underground utilities in areas of work. If utilities are to remain in place, the Contractor shall provide adequate means of support and protection during earthwork operations. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the utility company and the Owner or Owner's Representative immediately for direction. Cooperate with the Owner or Owner's Representative and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of the utility company and Owner or Owner's Representative. Do not interrupt existing utilities serving facilities occupied and used by the Owner or Owner's Representative or others during occupied hours, except when permitted in writing by the Owner or Owner's Representative and then only after acceptable temporary utility services have been provided. The Contractor must receive written notice to proceed before interrupting any utility.
- H. The use of explosives is not permitted.
- I. Barricade open excavations occurring as part of this work and post with warning lights if requested by the Owner or Owner's Representative. Protect structures, utilities, sidewalks, pavements, driveways, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
- J. Related work not included in this Section consists of the following:
- 1) Earthwork for Utilities under Division 4.
 - 2) Hot Mix Asphalt Pavement under Division 6.
 - 3) Topsoil under Division 8.
- K. Related Documents: The general provisions of the Contract, The Anne Arundel County *Standard Specifications for Construction* (latest edition), and all applicable supplements and addenda pertaining thereto apply to this Section.

3-2 Products

- A. **Structural Fill:** Structural fill reused from on-site soils or furnished by the Contractor for the construction of subgrades. Structural fill material shall conform to the following soil classification groups of the United Soil Classifications in accordance with ASTM D2487: GW, GP, GM, SW, SM and SP with a Plasticity Index (P.I.) less than 20.
- B. **Nonstructural Fill:** Nonstructural fill are soils that exist on-site or furnished by the Contractor that may be used in general site grading areas where structural fill is not required unless otherwise specified. Acceptable soils that may be used for nonstructural fill shall conform to the following soil classification groups of the United Soil Classifications in accordance with ASTM D2487: CL, CH, OL, and OH. Structural fill material may be used in designated non-structural fill areas however the Contractor shall bear any supplementary costs for importing and placing structural fill in non-structural fill areas with no additional cost to the Owner.

- C. Unsatisfactory Fill: Unsatisfactory Soil Materials shall conform to the following soil classification groups of the United Soil Classifications in accordance with ASTM D2487: GC, SC, ML, MH, and PT. Unsatisfactory materials also include man-made fills; trash; refuse; and material classified as satisfactory which contains root and other organic matter or frozen material. The Owner or Owner's Representative shall be notified of any contaminated materials.

3-3 Execution

- A. When excavation has reached the required subgrade elevations or one foot below existing grade, whichever is lower; the Owner or Owner's Representative will make an inspection along with the Contractor's soils testing agency. Any excavation below the proposed subgrade elevations indicated or one foot below existing grade, whichever is lower, will be considered unauthorized excavation.
- B. Unauthorized excavation, as well as remedial work directed by the Owner or Owner's Representative, shall be at Contractor's expense. Backfill and compact unauthorized excavations as specified or authorized excavations of same classification, unless otherwise directed by the Owner or Owner's Representative.
- C. If unsuitable bearing materials are encountered at required subgrade elevations or one foot below existing grade, whichever is lower, the Contractor shall immediately contact the Owner or Owner's Representative for direction regarding how to proceed. It may be necessary to carry excavations deeper and replace excavated material as directed by the Owner or Owner's Representative and/or stabilize as appropriate.
- D. Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.
- E. The Contractor shall implement all measures necessary to protect the subgrade under all pavements and structures from damage due to construction activities and equipment. The Owner or Owner's Representative makes no representations that the existing soils are adequate to support construction equipment and materials without damage to the subgrade. The Contractor shall include in his Base Bid all labor, materials, and equipment necessary to protect the subgrade from damage and shall repair any damage at no additional cost to the Owner.
- F. Dewatering necessary for completion of the work specified is considered to be incidental to the construction. The Contractor shall include all costs for dewatering equipment, labor and incidentals in the respective Bid Item associated with each aspect of the work. No additional cost will be paid by the Owner for dewatering activities. The Contractor shall conduct the dewatering activities subject to approval of the Owner or Owner's Representative and the Maryland Department of the Environment. The Contractor will be required to conduct the dewatering activities using adequate measures to control the release of sediment from the project site.
 - 1) Prevent surface water and subsurface or ground-water from flowing into excavations, adjacent waterways, and from flooding project site and surrounding area.
 - 2) Do not allow water to accumulate in excavations. Provide and maintain pumps, well points, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations.
 - 3) Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or run-off areas.

- G. Structural Fill shall be placed on "competent" existing materials following removal of topsoil and all organic material. Where visual observations and field tests determine that the founding materials are inadequate, it will be necessary to modify the founding materials by undercutting, moisture control, backfill, and compaction to a depth determined to be appropriate for the applicable structural loading conditions and backfilled with approved materials available on site or to be brought from offsite sources. This undercutting, moisture control, backfill, and compaction is considered to be incidental to the proposed work up to one foot below existing grade or the proposed subgrade, whichever is lower, and shall be included in the lump sum price bid. No cost extra will be considered for undercutting, moisture control, backfill, and compaction necessary to place fill on "competent" existing material up to one foot below existing grade or the proposed subgrade, whichever is lower. Any material deficit of the specified materials for backfilling of the one foot undercut zone specified shall be included in the **lump sum Base Bid** and shall result in no additional cost to the Owner.
- H. Stability of Excavations: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- I. Prior to the construction of pavements or the placement of fill in any structure areas, all existing organic materials, frozen or wet, excessively soft or loose soils, and other deleterious materials shall be removed and wasted. The existing organic bearing soil shall be stripped and can be stockpiled in designated areas set by the Owner for reuse at landscape areas. Ditches or swales at the site are subject to the intrusion of soft soils, organic soils and debris. Therefore, the Contractor should expect deeper deposits of organic soils and sediments in the swales.
- J. The native SM soils will be sensitive to alteration in moisture content and will become unworkable during and following periods of precipitation. For this reason, if earthwork is attempted in late autumn, winter or early spring, the importation of high quality, granular material will be permitted by the Owner or Owner's Representative at the Contractor's expense. Sand, gravel or sand/gravel mixtures would be appropriate for wet weather placement. The SM materials will become unworkable at moisture contents greater than 2.0 to 3.0 percentage points above optimum. The Contractor will be required to dry these materials in order to use them as suitable fill under structures and pavements and as backfill for retaining walls, or set them aside for use in landscape areas.
- K. Material Storage: Stockpile satisfactory excavated materials required for backfill or fill in areas designated by the Owner or Owner's Representative. Place, grade and shape stockpiles for proper drainage. Protect with erosion control measures as necessary. Prevent saturation of soil above the optimum moisture content.
- L. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain. Dispose of excess soil material and waste materials as herein specified.
- M. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth finish surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades. If earthwork is conducted in the presence of moisture, the traffic of heavy equipment, including heavy compaction equipment, may create pumping and a general deterioration of the subgrade soils. Construction traffic should be minimized at structural subgrade areas. If at all possible, the grading should be carried out during dry weather.

- N. Grade smooth and even, free of voids, compacted as specified and to required elevation. Provide final grades within a tolerance of 1/2" when tested with a 10' straight edge.
- O. Soil Testing Agency must approve subgrades and fill layers before further construction work is performed.
- P. Make at least one field density test of subgrade for every 1000 square feet of paved area or structure area. In each compacted fill layer, make one field density test for every 1000 square feet. The testing agency shall recommend additional testing if in their opinion, the above recommendations are not sufficient.
- Q. If in the opinion of the Owner or Owner's Representative, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense to the Owner or Owner's Representative.
- R. Cost of inspection and testing shall be borne by the Contractor.
- S. The Contractor's geotechnical consultant shall provide its professional opinion that the fill and backfill materials have been placed and compacted in accordance with the specification.
- T. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- U. Repair and re-establish grades in settled, eroded and rutted areas to specified tolerances.
- V. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape and compact to required density prior to further construction.
- W. Where settling is measurable or observable on excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact and replace surface treatment. Restore appearance, quality and condition of surface or finish to match adjacent work and eliminate evidence of restoration to greatest extent possible.
- X. Remove excess excavated earth materials and waste materials, including unacceptable excavated material, tree stumps, roots, greenery, trash and debris, and legally dispose of it off the Owner's property.
- Y. In addition to any other guarantee obligation contained elsewhere in General Conditions or specifications, Contractor shall be responsible for any settlement caused by work of the project and for any damage caused by such settlement during full length of guarantee period.

3-4 Measurement

All items of work in this Section shall not be measured for payment since their cost shall be included in the **lump sum price bid**.

END OF SECTION