

SECTION 02210
GENERAL EXCAVATION

02210.01 GENERAL

A. Description

1. General excavation shall include but not necessarily be limited to, excavation and grading for general site work, roadways, and rights-of-way to the lines and grades shown on the Plan, and in accordance with the Contract Documents.
2. In addition to the requirements contained herein, all grading operations shall be conducted in compliance with Subtitle 20 of the Anne Arundel County Code, "Grading and Sediment Control".
3. Unsuitable and excess materials removed in any excavation shall be removed from the project site and deposited in approved disposal sites or deposited in locations on the project designated on the Plans or by the Engineer. The unsuitable or excess material shall be placed, trimmed, shaped, sloped, and seeded and mulched in accordance with approved sediment control plans, or as directed by the Engineer, at the expense of the Contractor.
4. Cut and Fill Quantities

Cut and fill quantities may be shown on the Plans in the Summary of Quantities, together with information which will assist in the economical handling of the earthwork. It shall be understood, however, that while cut and fill quantities are computed from information obtained by preliminary surveys, inspections, and earthwork studies, the quantities are subject to change as a result of shrinkage or swell, type of equipment used on the Project, and the method of handling. It shall be the obligation of the Contractor to utilize all suitable materials from excavation in the construction of fills throughout the entire area of the Contract.
5. Excavation Classifications

Work done under the above operations shall be designated as Class 1 Excavation, Class 1-A Excavation, or Class 2 Excavation. Note that as subsequently described the width, type, and position of the work shall determine the classification, i.e., whether Class 1, Class 1-A, or Class 2.
6. Excavation Items

General excavation shall include the following:

- a. Cut areas within the boundary faces of the typical cross section(s) shown on the Plans, including ditches within the cut sections, and excavations for entrances, approach roads, streets, intersections, gutters, ditches, berm ditches, and flumes;
- b. Cut areas within the limits of construction as shown by proposed contours on the Plans;
- c. Topsoil to be salvaged within the limits of the work in accordance with the provisions of Section 02811;
- d. The removal and disposal of existing surfacing, sidewalks, curb, or curb and gutter, etc., in accordance with the provisions of Section 02160 when within the limits of construction;
- e. The removal and disposal of all foundation walls, basement, or ground level floors as well as timber, rubble, masonry, or pipe structures within the limits of construction and not otherwise provided for in the Proposal; refer to Section 02180.

If in the opinion of the Engineer excavation is needed, removal shall be made of slides, material, breakages, and cave-ins. When slides or washouts occur in either cut or fill, the damage shall be repaired by the Contractor. If the damage is not the result of his own carelessness, the Contractor will be paid for this work at the price bid for the class of excavation involved. If the material is to be removed from an embankment area, it will be necessary for the Engineer to have it measured for payment by means of additional preliminary and final cross sections or some other suitable method. If additional material is required to refill slides or washouts in embankments, the material will be measured and paid for as Class 1 or Borrow Excavation as the case may be.

Excavation for streams and channel changes shall be done except where the excavations would be covered under Section 02230. The Plans and "Special Provisions" will indicate when this occurs.

When additional excavation is ordered by the Engineer, rock, muck, root mat, and other unsuitable material shall be removed below the lowest normal limit of excavation shown on the Plans or below the natural ground line under embankments.

All suitable materials removed in excavation shall be used in embankments in accordance with the provisions of Section 02260 except that topsoil may be required to be salvaged and stored as specified.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.

2. Subfoundation Investigation; Section 02011.
3. Clearing and grubbing; Section 02110.
4. Removal or abandoning of existing utilities and underground structures; Section 02150.
5. Removal of existing pavement, sidewalk, curb, and combination curb and gutter; Section 02180.
6. Removal of existing masonry; Section 02180.
7. Removal of existing buildings; Section 02190.
8. Borrow excavation; Section 02240.
9. Salvaging topsoil; Section 02811.

C. Quality Assurance

All materials within the limits of construction that are to be incorporated in the work will be subject to test by the Engineer to determine their suitability for portions of the work in which the materials are to be placed. The tests may determine organic content, mechanical properties, bearing capacity, density, stability, or any other properties pertinent to satisfactory performance of the work proposed.

D. Submittals

The Developer, for Developer Projects, shall submit copies of all permits, results of subfoundation investigations, and the results of all compaction tests to the County.

02210.02 MATERIALS**A. Materials Furnished by the County**

The County will not furnish any materials for general excavation other than those materials, which are available within the excavation limits of the project site as designated on the Plans by sections, grade lines and/or contour lines.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. Embankment Material

Material for embankments shall meet the requirements of Section 02260.02.

2. Use of Excavated Material

All suitable material removed from the excavation shall be used as far as practicable in the formation of embankment, subgrade shoulders, slopes, backfill for structures, and at such other places as directed. No excavated material shall be wasted or otherwise removed from the project site without permission of the Engineer. Borrow shall not be used until provisions have been made for utilizing in embankments all available suitable excavated material.

3. Broken Pavement Material

Old pavement materials from roadway excavation shall be broken and placed in embankments in accordance with the provisions of Section 02260.02, or disposed of as excess or unsuitable material as previously specified.

4. Frozen Material

Material, which is otherwise acceptable but is excavated when frozen shall not be placed in embankments. It shall be stockpiled outside of construction limits and reserved for future use at a time when its condition is satisfactory for incorporation in embankment as determined by the Engineer. The cost of rehandling the excavation by this method shall be at the expense of the Contractor. Any such material, which is wasted, shall be replaced by the Contractor with other acceptable material at no expense to the County.

02210.03 EXECUTION**A. General**

The site or roadway shall be cut accurately to cross section and grade as shown on the Plans. No excavation from a ditch or channel change shall be deposited or left within 3 feet of the edge of the ditch or channel or be permitted to obstruct normal surface drainage to the ditch or channel. The Contractor shall maintain and keep ditches and gutters open and free from leaves and other debris until final acceptance of the work. Excavation for these appurtenances will only be measured once.

B. Drainage

1. During construction, the grading operations shall be performed in a manner such that the excavation will be well drained at all times. When necessary, excavations shall

be drained to sumps, which shall be pumped continuously, if required, to an approved sediment control device. The Contractor shall maintain and keep all ditches open and free from soil and debris while in service or until final acceptance of the work, and all grading shall be done on neat, regular lines conforming to the sections and contours shown on the Plans. All work shall be done in proper sequence with all other associated operations. Before any slab or surfacing is placed, all drainage facilities shall be installed which are required to permit free and uninterrupted flow of the surface and underground water from the site or to pumping sumps, etc.

2. During roadway construction, the roadbed shall be maintained in a well-drained condition at all times. Side and berm ditches or gutters draining from cuts to embankments or otherwise shall be so constructed as to avoid damage to embankments by erosion. All drainage necessary to provide free and uninterrupted flow of the surface and underground water shall be installed before surfacing is placed. When stabilized, side and outlet ditches provide the principal means for drainage, the cutting and stabilization of such ditches for the disposition of surface water shall be the first step in the grading operation.

C. Slopes

1. Earth Slopes

All earth slopes shall be finished in accordance with the contours, elevations, or to the lines on the typical section. The work shall be done in proper sequence with other operations involved.

2. Serrated Slopes

Serrated cut slopes are defined as slopes having continuously benched faces.

Slopes, which are to be serrated, will be shown on the Plans or so designated by the Engineer. The width of the benches will be designated by the Engineer. The ratio of bench width to bench height shall be the same as the slope ratio of the slope being excavated. The benches shall be constructed parallel to each other, and they shall be level, not graded to drain. The benches shall be cut during the excavation of the slope face. They shall be placed so that the normal slope line will bisect both the horizontal and vertical face of each bench. The horizontal face of each bench shall intercept the vertical face of the bench below.

Construction of serrated slopes shall not be a separate pay item but shall be considered as incidental to Class 1 Excavation.

3. Temporary Slope Construction

Slopes excavated or constructed for the convenience of the Contractor, such as for haul roads or temporary drainage, shall meet the design slope shown on the cross

sections for that area. Exceptions will require approval of the Engineer prior to construction of the slope.

Berm ditches, when required, shall be constructed before or at the time cuts are started.

D. Excavation Beyond Specified Limits

1. The widening of cut or excavation sections beyond the limits shown on the Plans is prohibited in all instances except by written order of the Engineer. When so ordered by the Engineer, the procurement of additional suitable materials for embankments, except as otherwise specified under Borrow Excavation, shall be done in accordance with the following provisions. None of the provisions shall be considered as relaxing the restrictions of Section GP-4.07.

2. Finished Excavation

The widening of cuts or excavation sections shall be finished so that completed flat and slope areas shall be uniform in appearance; the slopes shall be no steeper than the cut slopes indicated on the Plans and shall be in accordance with the line and slope directed by the Engineer.

3. Excavation Limits

If the Engineer directs the Contractor to excavate beyond the limits originally proposed and within the limits of the site, right-of-way, or easement prior to the starting of earthwork in an excavation section, then all material within the above limits shall be classified as General Excavation and will be paid for under its appropriate class.

4. Borrow Excavation Beyond Specified Limits

If the Engineer directs the Contractor to excavate beyond the limits originally proposed and within the limits of the site, right-of-way, or easement (after the Contractor has substantially completed the required excavation in a cut section), then all material removed beyond the limits of the section shall be classified as Borrow Excavation. All work and payment therefore will be in accordance with the requirements of Section 02240.

If in the opinion of the Engineer this additional excavation results in a substantial change in the characteristics of the work or in the type of materials encountered, a Supplemental Agreement may be negotiated as provided for in Section GP-4.07.

5. Class 1 Excavation

When, with the approval of the Engineer, the Contractor elects to obtain material by widening cuts beyond the limits originally set up and within the site, right-of-way, or

ement, the excavation of the materials shall be classified as Class 1 Excavation. All work and payment therefore will be in accordance with the requirements for Class 1 Excavation.

E. Unsuitable Material

1. Class 1-A Excavation

Unstable or other unsuitable material encountered at or below the lowest normal excavation limit or the subgrade for embankments as shown on the Plans for cuts and fills, which in the judgment of the Engineer should be removed, shall be removed to the extent directed by the Engineer. Removal shall be classified as Class 1-A Excavation.

2. Removal of Unsuitable Material and Backfilling

All spaces created by the removal of unsuitable material shall be backfilled to the lines and grades indicated. Backfill material shall be as specified in the "Special Provisions", and the construction methods shall meet the applicable requirements of Section 02260.03.

F. Widening Existing Pavement

In the case of excavation for base and/or surface widening, no more area shall be opened than can be paved the following day.

Where it is necessary to maintain traffic adjacent to a trench opened for widening, the Contractor shall provide signs, barricades, lights, flaggers, etc., in accordance with Sections GP-7.06, GP-7.07, and Sections 01410 through 01470. The existing road surfaces shall at all times be kept clean.

02210.04 METHOD OF MEASUREMENT

A. General

Excavation will be measured on a volume basis.

B. Excavation Classification

1. Class 1 Excavation

a. General Excavation

Excavation undertaken in the course of general site grading shall be Class 1 Excavation.

b. Roadway Excavation

Where roads, entrances, streets and/or intersections are 15 feet or more in width at the bottom of the cut, it shall be Class 1 Excavation. Where the width, however, is less than 15 feet at the bottom of the cut, it shall be Class 2 Excavation. The lower limit of measurement for these classifications shall be the surface upon which the base course or surfacing is to be placed in either pavement or shoulder areas if no sub base or selected capping material is used. Where sub base or selected capping material is specified, then the pay limit will be the surface upon which the materials are placed.

c. Concrete Pavements

In the case of concrete pavement, measurement will be taken to 1 foot outside of the outer edge of the pavement on each side except where concrete curb and gutter is built contiguous to the pavement.

d. Slides or Breakages

Slides or breakages not attributable to the carelessness of the Contractor as determined by the Engineer will be measured and included in the final quantities for Class 1 Excavation. Note that in the case of Class 1-A Excavation no allowances will be made.

e. Topsoil and Root Mat

Measurement will be made for the removal of topsoil when it is required to be removed from cut or fill areas, as well as the removal of root mat from fill areas. Work shall be classified as Class 1 Excavation irrespective of width. In the case of removal of root mat, however, the Class 1 classification shall only apply when the strata underlying the root mat are suitable for supporting embankment.

2. Class 1-A Excavation

Class 1-A Excavation shall include removal of unsuitable material when shown on the Plans, stipulated in the Special Provisions, provided for in the Proposal, or ordered by the Engineer below the lowest excavation limits established or specified for Class 1 Excavation. It shall also include the removal of root mat with underlying muck or other unsuitable material from areas upon which embankment is to be placed.

3. Class 2 Excavation

In addition to roads, entrances, streets, and/or intersections less than 15 feet in width at the bottom of the cut, Class 2 Excavation shall include excavation for flumes, inlet,

outlet, berm, and side ditches outside of the limits of cut or fill slopes, sediment basins, sediment traps, temporary ditches, and cleaning as required.

Class 2 Excavation will also be allowed as specified for stream or channel changes less than 15 feet in width at the flow line.

Material removed in operations described in this section will always be measured in its original position. No liquids, or free standing or flowing water will be included in any measurements or calculations for volumes. No measurement is to be made for any additional excavation required to construct new curb, curb and gutter, paved ditch, paved gutter, paved flume, or sidewalk paving. The cost of this excavation is to be included in the price bid for curb, gutter, pavement, etc.

C. Measurement

1. Class 1 and Class 2 Excavation Measurements

a. Template Method

Unless otherwise specified in the "Special Provisions", pay quantities of Class 1 Excavation within the boundary faces of the typical cross section(s) shown on the Plans will be computed from preliminary cross sections of the original ground surface combined with templates of the typical cross sections.

Where this method is specified, certain volumes will be excluded:

- 1) entrances and intersections for which details are not shown on the Plans and for which no quantity was allowed in the Proposal;
- 2) salvaged topsoil from under embankment;
- 3) removal of root mat.

Final quantities for 1) to 3) inclusive, if occurring, are to be measured in accordance with the Cross Section Method.

Further exceptions are:

- 4) where the Engineer has ordered in writing changes in design;
- 5) where the original ground conditions upon which preliminary cross sections were taken have been changed before the Contractor begins work;
- 6) where the Contractor has not completed the grade and cross section to that grade and cross section shown on the Plans or as changed by written orders from the Engineer. When the work of the Contractor is not in accordance with the line, grade, or cross section shown on the

Plans or as changed by subsequent orders of the Engineer, the Engineer will pay on reduced quantities of excavation except where the function of the design requires correcting the work.

b. Cross Section Method

Where specified, Class 1 Excavation quantities for payment will be computed from the cross sections of the original ground combined with final survey cross sections of the completed work. Class 1 Excavation will be allowed in median areas of cut section only where 4 inches of topsoil are to be placed. The Contractor's bid, therefore, shall consider that no areas, other than those specified above, will be adjusted for excavated volumes replaced with topsoil or sod. This method will also apply to Class 2 Excavation unless specified otherwise.

c. Site Grading

1) Grid Method

For site grading, Class 1 Excavation quantities for payment may be computed by the grid method. The size of the grid squares shall be as directed by the Engineer.

2) Contour-Area Method

For site grading, Class 1 Excavation quantities for payment may be computed by the contour-area method. The contour interval shall be as directed by the Engineer.

2. Class 1-A Excavation Measurement

Class 1-A Excavation will be measured and computed under provisions of the Cross Section Method of Subsection 02210.04.C.1.b.

The quantity of Class 1-A Excavation is subject to wide variation from that set up in the Proposal; therefore, no extra compensation or increase in price bid will be allowed if the final quantity varies from the Proposal quantity or if there is no final quantity for this item of work.

D. Recomputation of Quantities

The Contractor or the County may elect to make a recomputation of quantities in any section where it is believed the originally computed quantities are incorrect. When recomputation reveals error, the correct quantity shall be used.

02210.05 BASIS OF PAYMENT

A. General

1. Payments will be made at the unit prices bid. The prices bid shall include furnishing all labor, tools, equipment, and materials necessary to complete the work as shown and specified in strict accordance with the Contract Documents, and accepted by the Engineer.
2. Payment will be made for contingent items when ordered by the Engineer. Payment will be as specified in Sections 02951, 02952, 02953, 02954, 02955, 02956, and 02957.

B. General Excavation

Payment for general excavation will be made per cubic yard for Class 1 Excavation, Class 1-A Excavation, or Class 2 Excavation measured as provided above. The prices bid shall include all excavation and hauling; for the formation and compaction of embankments and backfills; for disposing of excess and unsuitable materials; for the preparation and completion of subgrade and shoulders, except as otherwise specified; and for rounded and transition slopes.

Payment will not be made for the excavation of any material, which is used for purposes other than those designated.