

## CATEGORY 200 GRADING

### SECTION 201—ROADWAY EXCAVATION (CLASS 1, CLASS 1-A, CLASS 2)

**201.01 DESCRIPTION.** This work shall consist of the excavation and grading for roadways and their appurtenances to the lines and grades specified in the Contract Documents. The Contractor shall use all suitable materials from excavation in the construction of embankments throughout the limits of the work as directed by the Engineer.

#### **201.01.01 Classification.**

CLASS 1 — All excavation where the width of the bottom of the cut is 15 ft or more.

CLASS 1-A — All excavation of unsuitable material below the lowest excavation limits established.

CLASS 2 — All excavation where the width of the bottom of the cut is less than 15 ft. Excavation for flumes, ditches, and stream and channel changes are included in this classification unless otherwise specified in the Contract Documents.

#### **201.01.02 Excavation.** Excavation shall include the following:

- (a) Cut areas within the boundary faces of the typical cross sections specified in the Contract Documents, including ditches within the cut sections, and excavation for entrances, approach roads, streets, intersections, gutters, ditches, berm ditches, and flumes.
- (b) Topsoil to be salvaged within the limits of excavation as specified in the Contract Documents or as directed by the Engineer.
- (c) The removal and disposal of existing pavement, sidewalks, curb and combination curb and gutter, when within the limits of any class of excavation. The work shall be as specified in Section 206.
- (d) The removal and disposal of below grade structures other than as specified in Sections 102 or 207.

#### **201.02 MATERIALS.** Not applicable.

### 201.03 CONSTRUCTION.

**201.03.01 Grading Units.** Each grading unit shall be the surface area of erodible earth that can be exposed to construction operations without undue erosion or sedimentation. Refer to 101.03.01 for the size and number of these units that can be opened at one time.

**201.03.02 Use of Excavated Materials.** No excavated material shall be wasted without prior approval of the Engineer. Borrow shall not be used unless provisions have been made for utilizing all available suitable excavated material in embankments. Refer to TC-3.04 and Section 203.

**201.03.03 Broken Pavement Material.** Existing pavement, sidewalks, gutter, curb or combination curb and gutter materials from the excavation may be broken and used in embankments. The broken material shall be considered as rock conforming to 204.02.01. If the Engineer considers the material to be unsuitable, it shall be disposed of as excess or unsuitable material.

#### 201.03.04 Rock Excavation.

- (a) **Boulders and Rock.** Boulders and rock from the excavation may be broken and used in embankment provided the materials conform to 204.02.01.
- (b) **Blasting.** Where rock encountered in cuts requires drilling and blasting, the finished slope shall remain reasonably straight and clean. The Contractor shall adjust blasting operations to obtain the required slope specified in the Contract Documents. Refer to TC-6.07.
- (c) **Presplitting.** When presplitting of rock slopes is specified in the Contract Documents, the presplitting operation shall be carried out prior to the primary blasting so knowledge gained from excavation of the presplit face may be applied to subsequent presplitting operations. No portion of any primary blast hole shall be drilled closer than half the spacing of the drilling pattern to the proposed finished slope.

The Contractor shall submit a plan for the proposed presplitting operations to the Engineer for approval. The plan shall include the drill size, lift height, explosives and detonator specifications, loading pattern, stemming materials, stemming depth, charge size, and charge timing.

The initial presplit shot shall not be longer than 100 ft. The Contractor shall drill holes along the slope line having a diameter

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of 2 to 3 in. Drill holes shall be placed at the slope angle as specified in the Contract Documents. All drill holes shall maintain the same plane. The initial presplit holes shall be drilled on maximum 3 ft centers and to a maximum depth of 20 ft unless otherwise directed by the Engineer. If the vertical depth of cut to be presplit is greater than the maximum permissible depth of holes as determined by the Engineer, the blasting shall be done in two or more lifts; in which case the first line of drill holes shall be set back a sufficient distance from the slope line to allow for a 1 ft offset for each succeeding line of drill holes.

The Contractor shall excavate the initial presplit shot for inspection by the Engineer prior to commencement of further presplitting. If the results are approved by the Engineer, the presplitting may continue using the approved drilling and loading pattern. Whenever the presplitting is found to be unsatisfactory, the Contractor shall make adjustments in the operations and repeat the inspection procedure used for the initial presplit shot.

The presplit face shall be within 6 in. from the front of the line of drill holes and 1 ft from the back of the line of drill holes except where the character of the formation being presplit (badly broken rock, vertical seams, etc.) will result in irregularities.

The line of presplit holes shall extend a minimum of 30 ft beyond the limits of the primary blast holes to be detonated or to the end of the cut.

Only cartridge explosives manufactured for presplitting shall be used. The maximum diameter of explosives used in presplit holes shall be half the diameter of the presplit hole. Bulk explosives are prohibited in presplit holes.

The Engineer may direct the discontinuance of the presplitting operations wherever the rock is of a character that no apparent advantage is gained.

**201.03.05 Frozen Material.** Frozen material is prohibited from being placed in embankments. It shall be stockpiled outside the construction limits and reserved for future use. Any material that is wasted shall be replaced. Rehandling of excavated material and replacement of wasted material shall be at no additional cost to the Administration.

**201.03.06 Serrated Slopes.** Serrated cut slopes are defined as slopes having continuously benched faces. Slopes that are to be serrated and the width and height of benches shall be as specified in the Contract Documents or as directed by the Engineer. The benches shall be

constructed parallel to each other, and they shall be level, not graded to drain, and shall be constructed as the excavation progresses.

**201.03.07 Drainage.** All drainage shall conform to Section 308. During construction of the roadway, the roadbed shall be maintained in a well drained condition at all times. Excavated material is prohibited from being deposited or left within 3 ft of the edge of the ditch or channel or be permitted to obstruct normal surface drainage into the ditch or channel. Ditches draining from cuts to embankments or otherwise shall be constructed 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 ditches for the disposition of surface water shall be the first work in the grading operation.

**201.03.08 Excavation Beyond Specified Limits.** The widening of cut or excavation sections beyond the limits of the typical cross section as specified in the Contract Documents is prohibited except by written authorization from the Engineer. When authorized by the Engineer the procurement of additional materials for embankments, unless otherwise specified under Borrow Excavation, shall conform to the following:

- (a) **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 not be steeper than the cut slopes specified in the Contract Documents or as directed by the Engineer.
- (b) **Roadway Excavation Limits.**
  - (1) If the Engineer directs the Contractor to excavate beyond the limits of the typical cross section originally proposed, prior to the starting of roadway excavation in a cut section, all material within the limits will be classified as Class 1 Excavation.
  - (2) If the Contractor, with approval of the Engineer, elects to obtain material by widening cuts beyond the limits of the typical cross section originally proposed and within the right-of-way or easement, the excavation of the materials will be classified as Class 1 Excavation.
- (c) **Borrow Excavation Beyond Specified Limits.** If the Engineer directs the Contractor to excavate beyond the limits of the typical cross section originally proposed after the Contractor has substantially completed the roadway excavation in a cut section,

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all material removed beyond the limits of the typical cross section will be classified as Borrow Excavation.

**201.03.09 Unsuitable Material.** Unstable or other unsuitable material encountered at or below the typical section specified in the Contract Documents shall be removed to the extent directed by the Engineer and classified as Class 1-A Excavation. In rock areas the limit of measurement for excavation will be at the bottom of the typical section. All voids created by the removal of unsuitable material, except when rock is encountered at subgrade, shall be backfilled to the lines and grades with the material specified in the Contract Documents. Backfill material shall conform to Section 916.

**201.03.10 Coal Deposits.** The Contractor shall notify the Bureau of Mines when coal is encountered on any construction project. The notice shall be sent to the Director, Bureau of Mines, Maryland Department of Natural Resources. Any coal encountered on the project shall be disposed of as directed by the Engineer.

**201.03.11 Widening Excavation Limits.** The area to be excavated for widening shall be limited to the extent that the excavated area can be backfilled within the same working day using the excavated material or common borrow to form a temporary wedge. Refer to Standard No. MD-104.92 for the area to be backfilled. The 4:1 or flatter fill slope shall be maintained. The material shall be compacted as directed by the Engineer and remain in place until placement of the graded aggregate base course.

**201.04 MEASUREMENT AND PAYMENT.** Roadway excavation will be measured and paid for at the Contract unit price per cubic yard for the pertinent Class of Excavation. The payment will be full compensation for all excavation and hauling, blasting, formation and compaction of embankments and backfills, disposing of excess and unsuitable materials, preparation and completion of subgrade and shoulders except as otherwise specified, serrated slopes, rounded and transition slopes, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment will not be made for excavation of any material used for purposes other than those designated.

### **201.04.01 Limits of Measurement.**

- (a) **Roadway Excavation.** The lower limit of measurement will be the surface upon which roadway materials, including base course, surfacing or selected capping material is to be placed in either pavement or shoulder areas.

- (b) **Concrete Pavements.** Measurement will be taken to 1 ft outside of the outer edge of the pavement on each side. Where concrete curb or combination concrete curb and gutter is built contiguous to the pavement, measurement for excavation will be the outer limits of the concrete curb or combination curb and gutter.
- (c) **Rocks and Boulders.** If ledge rock, scattered rock, or boulders of 1/2 yd<sup>3</sup> or larger volume are removed, any resulting undercutting approved by the Engineer will be measured for payment.
- (d) **Slides or Breakages.** Slides or breakages not attributable to the Contractor's negligence as determined by the Engineer will be measured and included in the final quantities for Class 1 Excavation.
- (e) **Topsoil and Root Mat.** Measurement will be made for the removal of topsoil and root mat when it is required to be removed from fill areas. In the case of removal of root mat, however, Class 1 Excavation shall only apply when the strata underlying the root mat are suitable for supporting embankment. If material is unsuitable for supporting embankment then removal of root mat and unsuitable material will be measured as Class 1-A Excavation.

Excavation will always be measured in its original position. No liquids will be included in any measurement.

No measurement will be made for any additional excavation required to construct new curb, curb and gutter, paved ditch, paved gutter, paved flume, or sidewalk paving.

**201.04.02 Template Method of Measurement.** Unless otherwise specified, excavation will be computed using the template from preliminary cross sections of the original ground surface combined with templates of the typical cross sections. If this method is used, certain volumes will be excluded.

Excluded volumes are:

- (a) Undercutting for cushion over rock.
- (b) Entrances and intersections for which details are not specified in the Contract Documents and for which no quantity was allowed in the Contract Documents.
- (c) Salvaged topsoil from under embankments.

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- (d) Removal of root mat from under embankments.

The template method will not be used:

- (a) Where there are approved changes in design and typical section.
- (b) Where there are approved deviations from planned slope faces in rock cuts.
- (c) Where the original ground conditions upon which preliminary cross sections were taken have been changed before the Contractor begins work.
- (d) For Class 1-A Excavation.
- (e) When the work of the Contractor does not conform to the line, grade, or cross section specified in the Contract Documents or as changed by subsequent written authorization by the Engineer. Unless corrective action is required, payment will be based on the changed quantities as determined by the cross section method in 201.04.03.

**201.04.03 Cross Section Method of Measurement.** When specified, quantities for payment of Excavation will be computed by average end areas, from the cross sections of the original ground combined with cross sections of the completed work. Class 1 Excavation will be allowed in median areas of cut sections only where 4 in. or greater of topsoil are to be placed. This method will also apply to Class 1-A and Class 2 Excavation unless otherwise specified.

**201.04.04** Presplitting will not be measured but the cost will be incidental to the Contract unit price per cubic yard for the pertinent Class of Excavation in which it occurs.

**201.04.05** Removal of existing pavement, sidewalk, paved ditches, curb or combination curb and gutter outside the limits of construction will be measured and paid for as specified in 206.04.

**201.04.06** Removal of existing pavement, sidewalk, paved ditches, curb or combination curb and gutter within the limits of any class of excavation will not be measured but the cost will be incidental to the Contract unit price per cubic yard for the pertinent Class of Excavation in which it occurs.

**201.04.07 Recomputation of Quantities.** The Contractor or the Administration may elect to recompute quantities in any section where it

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is believed the planned quantities are incorrect. When recomputation reveals an error, the corrected quantity will be used.

**201.04.08** The excavated material or common borrow required to fill the temporary wedge area in conformance with 201.03.11, maintaining the 4:1 or flatter slope, compaction, and removal of the material will not be measured but the cost will be incidental to the Contract unit price for the pertinent Class of Excavation. For measurement and payment of Drums refer to 104.12.04.

**201.04.09** Backfill for unsuitable material will be measured and paid for at the Contract unit price for the pertinent item specified in the Contract Documents.

### **SECTION 202 — CHANNEL OR STREAM CHANGE EXCAVATION (CLASS 5)**

**202.01 DESCRIPTION.** This work shall consist of excavation for changes in streams and channels when specified in the Contract Documents. The Contractor shall use all suitable materials from excavation in the construction throughout the Contract.

**202.02 MATERIALS.** Not applicable.

**202.03 CONSTRUCTION.** Refer to the applicable provisions of Section 201.

**202.04 MEASUREMENT AND PAYMENT.** Class 5 Excavation will be measured and paid for at the Contract unit price per cubic yard. The payment will be full compensation for all excavation and hauling, formation and compaction of embankments and backfill, backfilling old stream beds or otherwise disposing of excess and unsuitable materials, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Material will be measured in its original position and the volume computed by the Method of Average End Area. The cross sectional area measured will not include liquids. Measurement for Class 5 Excavation excludes any material removed outside the limits of payment as specified in the Contract Documents.