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 EXCAVATION: All excavation where the width of the bottom of the cut is 15 feet or more.

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

CLASS 2 EXCAVATION: All excavation where the width of the bottom of the cut is less than 15 feet. 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 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. The size and number of these units that can be opened up at one time are specified in the Contract Documents.

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.

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 to be 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 from the excavation may be broken and used in embankment provided the materials conform to 204.02.

(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.

(c) Pre-splitting. When pre-splitting of rock slopes is specified in the Contract Documents, the pre-splitting operation shall be carried in advance of the primary blasting so that knowledge gained from excavation to the pre-split face may be applied to subsequent pre-splitting 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 his pre-splitting operations. 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 purpose of the plan is to document the operation so that if adjustments are needed, rational decisions can be made.

The initial pre-split shot shall not be longer than 100 feet. The Contractor shall drill holes along the slope line having a diameter of not less than 2½ in. nor more than 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 pre-split holes shall be drilled on maximum 3 foot centers and to a maximum depth of 20 feet unless

otherwise directed by the Engineer. If the vertical depth of cut to be pre-split 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 foot offset for each succeeding line of drill holes.

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

The pre-split face shall not deviate more than 6 in. from the front of the line of drill holes nor more than 1 foot from the back of the line of drill holes except where the character of the formation being pre-split (badly broken rock, vertical seams, etc.) will, in the opinion of the Engineer, result in irregularities.

The line of pre-split holes shall extend a minimum of 30 feet beyond the limits of the primary blast holes to be detonated or to the end of the cut.

Only cartridge explosives manufactured for pre-splitting shall be used. The maximum diameter of explosives used in pre-split holes shall not be greater than half the diameter of the pre-split hole. Bulk explosives are prohibited in pre-split holes.

The Engineer may order the discontinuance of the pre-splitting operations wherever the rock is of a character that no apparent advantage is gained.

201.03.05 Frozen Material. Frozen material shall not be placed in embankments. It shall be stockpiled outside of the construction limits and reserved for future use at a time when its condition is acceptable to the Engineer. Rehandling of the excavated material shall be at the expense of the Contractor. The Contractor shall replace any wasted material with approved material at no expense to the County.

201.03.06 Serrated Slopes. Serrated cut slopes are defined as slopes having continuously benched faces. Slopes (which are to be serrated) and the width of benches will be as specified in the Contract Documents or as designated 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. During construction of the roadway, the roadbed shall be maintained in a well-drained condition at all times. No excavated material shall be deposited or left within 3 feet 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 in all instances except by written order from the Engineer. When so ordered by the Engineer, the procurement of additional suitable materials for embankments, except as otherwise specified under Borrow excavation, shall conform to the following provisions:

(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, and within the limits of the right-of-way or easement, prior to the starting of earthwork construction in an excavation section, then 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 and after the Contractor has substantially completed the roadway excavation in a cut section, then 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 lowest normal excavation limit as 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 normal plan section. All voids created by the removal of unsuitable material except when rock is encountered at sub-grade shall be backfilled to the lines and grades specified in the Contract Documents. Backfill material shall conform to Section 916.

201.03.10 Coal Deposits. The Contractor is required to notify the Maryland Department of Environment when coal is encountered on any construction project. The notice shall be sent to the Director, Maryland Department of Environment. Any coal encountered on the project

shall be disposed of as directed by the Engineer.

201.04 MEASUREMENT AND PAYMENT. Roadway 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 backfills, disposing of excess and unsuitable materials, preparation and completion of sub-grade 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 that is used for purposes other than those designated. Unless otherwise noted in the Special Provisions, measurement of ***Class 1 Excavation*** shall be by the Template Method.

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 foot 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 concrete curb and gutter.

(c) Rocks and Boulders. If ledge rock, scattered rock, or boulders of 1/2 cu yd 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 carelessness of the Contractor 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 removal is required 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.

(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 orders of 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, Excavation quantities for payment 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 topsoil depths of 4 in. or greater are to be placed. This method will also apply to ***Class 1A Excavation*** and ***Class 2 Excavation*** unless otherwise specified.

201.04.04 Pre-splitting will not be measured but the cost will be incidental to the Contract unit price per cubic yard for excavation.

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 construction for any class of excavation will not be measured but the cost will be incidental to the Contract price per cubic yard for the class of excavation in which it occurs.

201.04.07 Re-computation of Quantities. The Contractor or the County may elect to re-compute quantities in any section where it is believed the planned quantities are incorrect. When re-computation reveals an error, the corrected quantity shall be used.

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 Areas. The cross sectional area measured will not include water or other liquids. Measurement for channel or stream change excavation will not include any material removed outside the limits of payment as specified in the Contract Documents.

SECTION 203 - BORROW EXCAVATION

203.01 DESCRIPTION. This work shall consist of furnishing, excavating, hauling, and depositing approved materials for embankments and backfills when sufficient quantities of suitable materials are not available from other excavations as specified in the Contract Documents. It shall include all work prescribed for backfills, embankments, subgrade, and earth shoulders, all necessary clearing and grubbing, the removal and disposal of overburden or other unsuitable spoil material and the trimming, shaping, dressing, draining, and reclamation of the pit or location from which borrow material is secured.

203.01.01 Contractor's Options. The Contractor, as a duly authorized agent of the County, may elect one of the following three methods to obtain borrow material for use on public highway Contracts:

OPTION 1 — Acquire material from a licensed commercial operating supplier.

OPTION 2 — Make application to the Department of Environment under the Annotated Code of Maryland, Article 26.21.01.02, entitled "Surface Mining".

OPTION 3 — Make application to the County to operate under the standard adopted in conformance with the Annotated Code of Maryland, Article 26.21.01.08, entitled "Exemptions." A Contractor who elects to use Option 3 shall submit an application to the County and all appropriate agencies fulfilling all the requirements of the cited subtitle.

203.01.02 Notice to Contractor - Borrow Pits. The Contractor will be responsible for obtaining all necessary permits. The Contractor shall submit to the Engineer written proof that all permits and/or approvals have been secured for the borrow pits. All shall be in accordance with Baltimore County's floodplain laws and regulations.

203.01.03 RESERVED

203.02 MATERIALS. Materials shall conform to Section 916.

203.03 CONSTRUCTION.

203.03.01 Clearing and Grubbing. Clearing and grubbing shall conform to Section 101.

203.03.02 Borrow Pit Material. The Contractor shall notify the Engineer 30 days in advance of the opening of any borrow pit so that soil analysis, elevations, and measurements of the ground may be made. After the pit is opened the material excavated is to be used only for the project intended. The Contractor shall not excavate additional material for other purposes until a final survey is made of the pit.

Borrow Pit After Excavation. The borrow pit shall conform to the Reclamation (Permit) Plan after the necessary quantity of materials has been removed. Steep slopes and sheer faces shall be avoided. All disturbed areas shall be seeded and mulched at the Contractor's expense as specified in Section 705. These shaping and seeding requirements do not apply to commercial borrow pits.

203.03.03 Reserved

203.03.04 Reserved

203.03.05 Borrow Excavation Beyond Specified limits. Refer to 201.03.08.

203.03.06 Compaction. Refer to 204.03.04.

203.04 MEASUREMENT AND PAYMENT. ***Borrow Excavation*** will be measured and paid for at the Contract unit price per cubic yard. The payment will be full compensation for clearing and grubbing, furnishing, excavating and hauling, sloping, draining and reclamation of pits (if Option 2 or 3 is selected), the formation and compaction of embankments, backfills, subgrade, manipulation and additives for select borrow, all work and materials for earth shoulders except as otherwise specified, disposing of all unsuitable spoil material, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. For materials delivered by weight, the volume shall be determined by dividing weight received by typical in-place density of the compacted material.

When requested by the Contractor in writing, the Engineer may approve an alternate method of measurement for computing borrow excavation quantities. This alternate method will not be considered for approval unless the Contractor can show that the cross section method computed by average end area is not a feasible method of measurement. When approved in writing by the Engineer, this alternate method shall consist of measuring the Borrow Excavation in approved hauling vehicles in the following manner:

(a) The Contractor shall designate, prior to the start of hauling operations, the identification number of vehicles to be used. The Engineer will determine the water level capacity of each vehicle so designated. The measured capacity shall be multiplied by a factor of 0.85 to determine the pay volume.

(b) The Contractor shall furnish a delivery ticket to the Engineer for each load of borrow material delivered to the project. Any ticket not signed by the Engineer to acknowledge receipt will not be used in the computation of the borrow quantity.

The ticket shall include the following information:

(1) The supplier's name.

(2) The County's Contract number.

(3) The date and ticket number.

(4) Vehicle identification number.

(5) Type of material delivered.

(6) Pay volume computed as specified in (a).

SECTION 204 - EMBANKMENT AND SUBGRADE

204.01 DESCRIPTION. This work shall consist of constructing the embankment and subgrade of suitable material obtained from roadway, structure, borrow, and other excavation included in the Contract, and it shall be placed, processed, and compacted to the lines and grades specified in the Contract Documents.

204.02 MATERIALS. Soils and soil aggregate mixtures used in the construction of embankments shall conform to the common borrow requirements in Section 916 unless otherwise specified in the Contract Documents.

204.02.01 Rock. Rock may be used in embankments, provided that individual pieces do not exceed 24 in. in any dimension. Larger size rocks may be wasted with the approval of the Engineer.

204.02.02 Frozen Material. Frozen material shall not be placed in embankments. It shall be stockpiled outside the construction limits and reserved for future use at a time when its condition is acceptable to the Engineer. Re-handling of the excavated material shall be at the expense of the Contractor. Any material that freezes after being placed in the embankment shall not be covered until it has thawed. The Contractor shall replace any wasted material with approved material at no expense to the County.

204.02.03 Embankment Adjacent to Structures. The Engineer may require the use of specially selected material adjacent to structures to insure good compaction or to protect the structure from damage. Rock shall not be used. Where embankment material is placed at locations of pile supported foundations the material shall be such that piles may be easily driven through the embankment material.

204.03 CONSTRUCTION.

204.03.01 Embankment Foundation.

(a) Foundation Material. Prior to the construction of an embankment, the Engineer will inspect the foundation. Topsoil, root mat, or unsuitable material shall be removed to the depth directed by the Engineer.

(b) Embankment Over Existing Pavement. When the embankment is placed on an existing pavement, the pavement shall be thoroughly broken up, scarified or removed as specified in the Contract Documents or as directed by the Engineer.

(c) Test Rolling. When test rolling is specified in the Contract Documents or directed by the Engineer, the foundation shall be tested by rolling with a 35 ton pneumatic tired roller, or other as approved by the Engineer.

204.03.02 Placing and Spreading. The material shall be placed in horizontal layers across the full width of the embankment. An adequate crown shall be maintained to provide drainage at all times. Side slopes shall be maintained at the specified slope throughout the progress of the work.

(a) Embankment on Unstable Ground. When embankment is to be constructed in wet and unstable ground that will not support the weight of the construction equipment, the first layer of the fill may be constructed by depositing material in a layer no thicker than that required to support the equipment. Subsequent layers shall be 8 in. compacted depth.

(b) Earth Embankment. Except as otherwise specified, no layer shall exceed 8 in. compacted depth.

(c) Rock Embankment.

(1) In rock embankment, the thickness of layers shall be determined by the size of the rock, but in no case shall layers exceed 24 in. depth. The portion of the embankment less than 6 feet below the subgrade at the profile grade line shall be placed in layers not more than 8 in. compacted depth, and these layers shall be filled solid and fully choked with spalls, rock dust, or earth. Each layer shall be filled and compacted before the next layer is placed.

(2) The top of the rock material shall provide a uniform surface, determined by connecting with straight lines the points on the typical cross section which are 9 in. below any median ditch invert and 9 in. below the bottom of the pavement structure and then sloping downward and outward under the shoulders at the rate of 3/4 in. per ft to the outer slope of the embankment.

(3) The remaining upper portion of the embankment, unless otherwise specified in the Contract Documents, shall be constructed of suitable earth, free from stones that would be retained on a 3 in. sieve.

204.03.03 Benching. When embankment is to be placed and compacted on hillsides or when new embankment is to be compacted against existing embankments, the slopes on which the embankment is to be placed shall be continuously benched where they are steeper than 4:1 when measured at right angles to the roadway. The benching operation shall be done as the embankment is brought up in layers. Benching shall be of sufficient width to permit operation of placing and compacting equipment with a minimum width of 5 feet. Each horizontal cut shall begin at the intersection of the original ground and the vertical sides of

the previous cut. Material meeting embankment requirements cut from the benches shall be compacted along with the new embankment material at the Contractor's expense.

204.03.04 Compaction. Immediately after spreading of each layer, the material shall be compacted with compaction equipment approved by the Engineer. Rolling shall be done in a longitudinal direction along the embankment, beginning at the outer edges and progressing towards the center. The travel paths of traffic and equipment shall be dispersed over the width of the embankment to aid in obtaining uniform compaction.

Material 1 foot below the top of subgrade shall be compacted to not less than 92 percent of the maximum dry density as specified in T 180. Material in the top 1 foot shall be compacted to not less than 95 percent of the maximum dry density. When necessary, the layer shall be wetted or dried in order to compact the layer to the required density.

204.03.05 Stability of Embankments. The Contractor shall be responsible for the stability of all embankments in the Contract and shall remove and replace with acceptable material any embankment or portion thereof which has been constructed with unsuitable material. The Contractor shall bear the expense of removing and replacing unstable material as well as removing and replacing portions of the embankment that become unstable or displaced as the result of Contractor negligence.

204.03.06 Protection of Structures and Utilities During Construction. The Contractor shall be responsible for protecting all structures and utilities from any damage in the handling, processing, or compacting of embankment or backfill material. Particular care shall be exercised in the vicinity of arches, retaining walls, culverts, and utility trenches to assure that no undue strain or movement is produced. In areas where rollers cannot be used, the embankment or backfill shall conform to Section 210.

204.03.07 Subgrade.

(a) The subgrade shall be constructed and shaped to the specified cross section after all cuts, embankment and backfilling have been substantially completed. The subgrade shall be proof rolled as specified in 204.03.01 (c).

(b) Before any Developer contracts are initiated, grading shall be completed to the established subgrade within a tolerance of two inches for the full width of the road or street right-of-way. The Contractor shall make final subgrade preparation and compaction of the subgrade. All unsuitable material found in the subgrade shall be replaced with crusher run stone CR-1 or CR-6. The Engineer will determine which type of stone material to be used.

204.03.08 Maintenance. During construction and after completion of the embankment and subgrade, the Contractor shall maintain the embankment and subgrade until finally accepted. Embankment and subgrade material which may be lost or displaced as a result of natural causes such as storms and cloudbursts, or as a result of unavoidable movement or settlement

of the ground or foundation upon which the embankment and subgrade is constructed shall be replaced by the Contractor with acceptable material from excavation or borrow. The Contractor shall at all times maintain ditches and drains to provide adequate drainage. The travel paths of any traffic or construction equipment on the finished embankment and subgrade shall be held to a minimum to avoid the displacement of material or formation of ruts. When ruts 2 in. or more in depth are formed in the subgrade they shall be removed by reshaping and recompacting.

204.04 MEASUREMENT AND PAYMENT. Embankment, Subgrade, and all necessary work will not be measured but the cost will be incidental to the Contract unit price per cubic yard for the pertinent classes of excavation. The Contract unit price per cubic yard shall include the formation, sprinkling, compacting, test rolling, shaping, scarifying, breaking or removing of the existing pavement, sloping, trimming, finishing, maintaining embankments and subgrade, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Excavation and replacement of material for 204.03.07(b) shall be measured and paid for at the contract unit price per cubic yard for ***Class 1A Excavation*** and refill with ***Crusher Run CR-1*** or ***Crusher Run CR-6*** stone.

Replacement of material lost as a result of natural causes will be measured and paid for at the Contract unit price per cubic yard for ***Class 1 Excavation*** or ***Borrow Excavation*** as directed by the Engineer.

Compaction by means of mechanical tampers or vibratory compactors will not be measured nor paid for except when an item for ***Tamped Fill*** is included in the Contract Documents.

These Provisions for Measurement and Payment do not apply to UA and RA contracts.

SECTION 205 - TEST PIT EXCAVATION

205.01 DESCRIPTION. This work shall consist of excavation and backfilling for test pits to determine the location of underground structures and utilities as specified in the Contract Documents or as directed by the Engineer.

205.02 MATERIALS. Not applicable.

205.03 CONSTRUCTION. It shall be the responsibility of the Contractor to determine the location of underground structures and utilities by the use of test pit excavation prior to excavation operations.

Test pits shall be of the size, depth and location as authorized by the Engineer. Each pit that is excavated by using conventional (non-vacuum) excavation equipment shall be tamp backfilled as specified in Section 210 following completion of utility work at the test pit location, as approved by the Engineer.

All test pits shall be done a sufficient distance ahead of work so that changes in line and grade, or relocation of existing utilities may be done without hindering construction progress. The test pit excavation may be left unfilled if the proposed utility proceeds through the test pit location and temporary plating is adequate to provide protection of the public during the proposed period of work.

205.04 MEASUREMENT AND PAYMENT. Refer to Section 109 regarding fixed price items. ***Test Pit Excavation / Conventional Excavation Methods*** that use non-vacuum equipment will be measured and paid for at the Contract unit price per cubic yard for the material actually removed from within the limits specified. ***Test Pit Excavation by Vacuum Up to 6 Ft. Depth*** shall be measured and paid for at the Contract Unit Price per each test hole excavated up to 6 feet deep. ***Additional Test Pit Excavation by Vacuum Below 6 Ft. Depth*** shall be measured and paid for at the Contract Unit Price per vertical foot of depth required to locate and identify the utility under investigation except when otherwise specified in Contract Documents. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. Tamped backfill will not be measured but the cost will be incidental to the Contract unit price per cubic yard for ***Test Pit Excavation***. Any pavement to be replaced will be paid for as specified in Section 106.

SECTION 206 - REMOVAL OF EXISTING PAVEMENT, SIDEWALK, PAVED DITCHES, CURB OR COMBINATION CURB AND GUTTER

206.01 DESCRIPTION. This work shall consist of the full depth removal and disposal of existing pavement, sidewalk, paved ditches, curb or combination curb and gutter as specified in the Contract Documents or as directed by the Engineer.

206.02 MATERIALS. Not applicable.

206.03 CONSTRUCTION. The Contractor shall saw cut the existing pavement, sidewalk, paved ditches, curb or combination curb and gutter along the lines specified in the Contract Documents or as directed by the Engineer. The Contractor shall not damage sections that are not to be removed. Damage done by the Contractor to those areas to remain in place shall be repaired or restored at the Contractor's expense.

206.03.01 Broken Material. Broken pavement, sidewalk, paved ditches, curb or combination curb and gutter materials may be broken and used in the work with the approval of the Engineer. The broken material shall be considered to be rock as specified in 204.02.01.

206.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all work specified regardless of the type or depth of material removed and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

206.04.01 Removal of Existing Pavement, Sidewalk, Paved Ditches, Curb or Combination Curb and Gutter within the limits of construction for any class of excavation will not be measured but the cost will be incidental to the Contract unit price per cubic yard for the class of excavation in which it occurs.

206.04.02 When this work falls outside the limits of construction, it will be measured in the original position and paid for as follows:

(a) ***Saw Cuts*** per linear foot when specified in the Contract Documents.

(b) ***Removal of Existing Pavement***, ***Removal of Existing Sidewalk***, and ***Removal of Paved Ditches*** per cubic yard.

(c) ***Removal of Existing Curb*** or ***Removal of Existing Combination Curb and Gutter*** per linear foot.

SECTION 207 - REMOVAL OF EXISTING MASONRY

207.01 DESCRIPTION. This work shall consist of removing all or part of existing concrete, concrete block, brick or stone structures (headwalls, toe walls, etc.), including concrete piles as specified in the Contract Documents or as directed by the Engineer. Removal of existing bridge structures shall conform to Section 402.

207.02 MATERIALS. Not applicable.

207.03 CONSTRUCTION.

207.03.01 Removal. All removal shall be to an elevation of at least 1 foot below subgrade or existing ground, unless otherwise specified in the Contract Documents or as directed by the Engineer. Blasting will not be permitted without the written approval of the Engineer. Piles, grillages, or cribbing under removed masonry shall be cut off and removed to these limits.

207.03.02 Use of Removed Masonry. Masonry material may be broken and used in the work. The broken material shall be considered to be rock in conformance with 204.02.01. If the Engineer determines the material to be unsuitable material, it shall be disposed of as excess or unsuitable material.

207.03.03 Protection of Retained Masonry. Retained sections that are damaged shall be repaired or replaced in a manner acceptable to the Engineer at the Contractor's expense. Connecting edges and surfaces shall be cut to lines specified in the Contract Documents or as directed by the Engineer.

207.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all excavation, backfill, disposal of excess or unsuitable material, blasting, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

207.04.01 ***Removal of Existing Masonry*** will not be measured but will be paid for at the Contract lump sum price.

207.04.02 When specified in the Contract Documents, ***Removal of Existing Masonry*** will be measured and paid for at the Contract unit price per cubic yard.

SECTION 208 - SUBGRADE PREPARATION

208.01 DESCRIPTION. This work shall consist of the preparation, protection, and maintenance of the subgrade prior to the construction of any succeeding courses.

208.02 MATERIALS. Materials shall conform to Section 916.

208.03 CONSTRUCTION. After roadway excavation and embankments have been completed and the requirements of Section 204 have been met, the subgrade shall be fine graded and compacted to a density not less than 95 percent of maximum dry density as specified in T 180.

208.03.01 Removal and Replacement of Unsuitable Material. All soft and unstable material and any other portions of the subgrade that will not properly compact shall be removed, disposed of and replaced with suitable material and compacted.

208.03.02 Subgrade Control. The subgrade surface shall be brought to line and grade and shaped to the specified cross section. Grade shall be set for subgrade control both longitudinally and transversely with fixed controls not to exceed 25 feet spacing. The

finished subgrade shall not deviate more than a half inch from the established grade. It shall be compacted and smoothed over its full width by the use of an approved, smooth faced steel wheeled roller or by mechanical tampers and vibratory compactors if rolling is not feasible.

208.03.03 Bleeder Ditches. The Contractor shall at all times maintain adequate open bleeder ditches along the subgrade to keep it thoroughly drained. Erosion and sediment control practices conforming to Section 308 shall be maintained.

208.03.04 Subgrade Maintenance. Maintenance of the subgrade shall be the responsibility of the Contractor. The Contractor shall take precautionary measures to prevent damage by heavy loads or equipment. Any defects or damage shall be repaired or replaced at the Contractor's expense.

208.03.05 Subgrade Approval. No subsequent cover material shall be deposited upon a subgrade when it is frozen nor until it has been checked and approved by the Engineer.

208.04 MEASUREMENT AND PAYMENT. Subgrade Preparation, including bleeder ditches and any mechanical tamping will not be measured but the cost will be incidental to other pertinent items specified in the Contract Documents.

SECTION 209 - TRIMMING EXISTING DITCHES

209.01 DESCRIPTION. This work shall consist of trimming, sloping and shaping existing ditches, within the limits and to the lines and grades as specified in the Contract Documents. Included in the work is clearing and grubbing and the removal and disposal of surplus or unsuitable materials.

209.02 MATERIALS. Not applicable.

209.03 CONSTRUCTION. Clearing and grubbing for trimming existing ditches shall conform to Section 101. Existing ditches shall be trimmed, sloped, and shaped to a uniform grade and cross section. The side slopes shall be constant and shall not be steeper than 1:1 unless otherwise specified. Surplus or unsuitable materials removed shall be disposed of as specified in Section 201.

209.04 MEASUREMENT AND PAYMENT. ***Trimming Existing Ditches*** will be measured and paid for at the Contract unit price per linear foot of existing ditches on which work has been completed. Measurement will be along the center line of the ditch.

The payment will be full compensation for all clearing, grubbing, excavation, disposal of surplus and unsuitable materials and for all labor, equipment, tools, and incidentals necessary to complete the work.

SECTION 210 - TAMPED FILL

210.01 DESCRIPTION. This work shall consist of compacting embankment and backfill materials by means of mechanical tampers or vibratory compactors. This method of compaction shall be used wherever materials cannot be adequately compacted by other methods approved by the Engineer.

210.02 MATERIALS. Embankment and backfill material to be tamped shall conform to Section 916.

210.03 CONSTRUCTION. After the Engineer has given permission to backfill, the areas to be tamped shall be filled with approved materials furnished from excavation and supplemented by additional approved material. The material shall be placed in horizontal layers not to exceed 6 in. of loose depth over the entire area to be tamped and uniformly compacted by means of mechanical tampers or vibratory compactors. The moisture and compaction requirements shall conform to 204.03.04.

When backfilling around abutments, retaining walls, culverts, utilities, or other structures, special care shall be taken to prevent any wedging action against the structure by the material being compacted. The existing slopes to be filled against shall be benched or stepped. The backfill shall be constructed in horizontal layers as described above and wide enough that there shall be a horizontal berm of thoroughly compacted material behind the structure at all times for a distance at least equal to the height of the structure remaining to be backfilled, except insofar as disturbed material protrudes into this space. Tamping may be required over additional widths when the material cannot be adequately compacted by other methods. When structures are installed below subgrade in embankments, the tamped fill shall be placed to a depth of 1 foot over the top of the structure, while in excavation sections the tamped fill shall extend to the surface of the finished earthwork.

210.04 MEASUREMENT AND PAYMENT. Compacting embankments and backfills by mechanical tampers or vibratory compactors will not be measured but the cost will be incidental to the other bid items unless a pay item for ***Tamped Fill*** is included in the Contract Documents.

SECTION 211 — GEOSYNTHETIC STABILIZED SUBGRADE USING GRADED AGGREGATE BASE

211.01 DESCRIPTION. Furnish and place a layer of geotextile and 12 in. minimum of graded aggregate base to bridge unstable material and minimize the use of undercutting. Use this item only when specified or directed. In extremely unstable areas, the Engineer may increase the thickness of the graded aggregate base material.

211.02 MATERIALS.

Graded Aggregate Base	901.01
Geotextile for Subgrade Stabilization Class ST	921.09
Securing Pins or Staples	921.09

211.03 CONSTRUCTION.

211.03.01 Test Strip. In extremely unstable areas, the Engineer may direct that a test strip be constructed to determine the thickness of aggregate layer required to stabilize the area. The Engineer will determine the depth of aggregate to be used in the test strip. Construct the test strip a least 100 feet in length and at least one lane wide. The results of the test strip will be used to determine the thickness of aggregate required for subsequent construction.

211.03.02 Grade Preparation. Cut the area where the geotextile is to be placed to the depth shown or as directed. Bring the area to the specified line, grade, and cross section. Provide a grade that is smooth as practical and free of debris. Minimize construction traffic on the grade. Remove ruts by reshaping, but do not overwork the grade. Have the grade approved prior to placement of the geotextile. Maintain adequate surface drainage as specified in 208.03.03.

The Engineer may waive compaction and moisture requirements for the underlying soil.

211.03.03 Geotextile Placement. Place geotextile on the prepared surface for the full width of the area to be treated. In areas where longitudinal underdrain is to be placed, place the geotextile up to the edge of the proposed longitudinal underdrain trench, but not where the trench is to be excavated.

Unroll the geotextile parallel to the base line. Do not drag the geotextile across the grade. Remove wrinkles and folds by stretching and pinning.

Overlap the geotextile at least 30 in. at roll edges and ends. Overlap the end of the roll in the direction of aggregate placement, with the roll being covered by aggregate on top of the next roll. Pin all roll ends and roll end overlaps a maximum of 5 feet on center. Pin roll edges and roll edge overlaps a maximum of 50 feet on center.

For curves, fold or cut the geotextile and overlap in the direction of the turn. Pin folds in the geotextile a maximum of 5 feet on center. Immediately repair or replace damaged geotextile as directed. Overlap geotextile patches at least 3 feet into undamaged geotextile.

Do not allow traffic, including construction equipment, on the bare geotextile.

211.03.04 Aggregate Placement. Place the graded aggregate base as specified in Section 501, with the following exceptions:

(a) Placement and Spreading. Place the graded aggregate base within three working days of geotextile placement. Use the end dumping and spreading method. Place a single lift parallel to the baseline and at the thickness required to provide the specified compacted depth. Keep the turning of construction equipment on the graded aggregate base to a minimum.

(b) Density Requirements. Immediately after placement, compact the graded aggregate base material to the required density. Unless otherwise directed, compact the top 6 in. to at least 95 percent of maximum dry density within 2 percent optimum moisture. Use T 180 to determine the optimum moisture content and maximum dry density. Compaction requirements will be waived for the graded aggregate base material below the top 6 in.

(c) Vibration. Unless otherwise specified or directed, do not vibrate graded aggregate base.

211.04 MEASUREMENT AND PAYMENT. ***Geosynthetic Stabilized Subgrade*** Using Graded Aggregate Base will be measured and paid for at the Contract unit price per cubic yard. The payment will be full compensation for the test strip, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.