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 sitework, 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 the Charles County "Grading Ordinance".

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 County 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 County Engineer, at the expense of the Contractor.

4. 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.

   a. Class 1 - All excavation where the width of the bottom of the cut is 15 feet or more.

   b. Class 1-a - All excavation of unsuitable material below the lowest excavation limits established.

   c. Class 2 - All excavation where the width of the bottom of 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.

5. 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 County 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.

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 County 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 County 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

RESERVED FOR FUTURE USE

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 by the County Engineer. No excavated material shall be wasted or otherwise removed from the project site without permission of the County 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 County 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 County Engineer. The width of the benches will be designated by the County 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.

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 County 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

RESERVED FOR FUTURE USE

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 County Engineer should be removed, shall be removed to the extent directed by the County 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.

The contractor shall utilize or dispose of unsuitable material. It shall be the contractors responsibility to obtain any and all necessary approvals or permits to dispose of such unsuitable material on site or off site.

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

RESERVED FOR FUTURE USE

B. Excavation Classification

RESERVED FOR FUTURE USE

C. Measurement

RESERVED FOR FUTURE USE

D. Recomputation of Quantities

RESERVED FOR FUTURE USE

02210.05 BASIS OF PAYMENT

A. General

RESERVED FOR FUTURE USE

B. General Excavation

RESERVED FOR FUTURE USE

SECTION 02220

STRUCTURE EXCAVATION

02220.01 GENERAL

A. Description

1. Structure excavation shall include, but not necessarily be limited to excavation for bridges, drainage structures, retaining walls, and building foundations as shown on the Plans and in accordance with the Contract Documents.

2. All suitable materials removed in the excavation shall be used in the backfill of structures, in approach embankments, as indicated on the Plans, or as directed by the County Engineer.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.

2. Clearing and grubbing; Section 02110.

3. Removal or abandonment of existing utilities and underground structures; Section 02150.

4. Removal of existing pavement, sidewalk, curb, and combination curb and gutter; Section 02160.

5. Removal of existing masonry; Section 02180.

6. Removal of existing buildings; Section 02190.

7. Borrow excavation; Section 02240.

8. Salvaging topsoil; Section 02811.

C. Quality Assurance

All materials from structure excavations that are to be incorporated into the work will be subject to test by the County Engineer to determine its suitability for the portions of the work in which the material is to be placed. The tests may determine organic content, mechanical properties, bearing capacity, density, stability, or any other properties pertinent to the satisfactory completion of the work indicated.

D. Submittals

1. Test results and certificates of suitability by a licensed engineer shall be submitted to the County before any foundation concrete is poured or foundation piles driven.

2. Design calculations and details for cofferdams and other excavation support systems, sealed by a Registered Professional Engineer in the State of Maryland, shall be submitted to the County for comment prior to performing any excavations.

02220.02 MATERIALS

A. Materials Furnished by the County

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

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. Use of Excavated Material

   All suitable materials removed from the excavation shall be used as far as practicable in the formation of embankments, backfill, or at other places as directed by the County Engineer. No excavated material shall be wasted or otherwise removed from the project site without permission of the County Engineer. Boulders, logs, or any other unforeseen obstacles encountered shall be removed. As the material is excavated, it shall be separated into suitable or unsuitable material. The suitable material shall be placed in backfill or stored for future use. The unsuitable material shall be disposed of off-site in an approved disposal area.

2. Selected Backfill

   Selected backfill for structure foundation shall be as specified in Section 02245.02.

02220.03 EXECUTION

A. General

1. Excavation Considerations

   The Contractor shall not excavate any area within the project site without permission from the County Engineer. All excavation contiguous to existing pavements and structures shall be sheeted, shored, braced and supported in a substantial manner to prevent settlement, movement or damage. No excavated material shall be deposited at any time so as to endanger the partly finished structure either by direct pressure or indirectly by overloading banks contiguous to the operation. Trenches or foundation pits for structures or structure footings shall be excavated to the lines and grades or elevations shown on the Plans or as directed by the County Engineer. They shall be of sufficient size to permit the placing of the full width, depth and length of the structure or footing shown.

2. Adjustment of Footing

The County Engineer reserves the right to change locations, elevations or shapes of footings as foundations are exposed. If suitable material is encountered at elevations above planned footing bottoms, the footing will be redesigned to make the most efficient use of the material.

B. Foundations

1. Footing Foundations

a. Footings for structures shall be on suitable foundations, and no concrete shall be poured or foundation piles driven until the foundations are certified as suitable by a licensed engineer obtained by the Contractor to inspect and test the foundation work.

b. Faces of footings shall be placed against plumb undisturbed material. If excavation will not stand plumb, the Contractor shall furnish and install sheeting as required. Sheeting for this purpose shall be left in place. All hard foundation material shall be cleaned of all loose material and cut to a firm surface, either level, stepped or serrated as directed by the County Engineer. All seams or crevices shall be cleaned out and grouted. When masonry is to rest on an excavated surface, special care shall be taken not to disturb the bottom of the excavation; and the final removal of the foundation material to grade shall not be made until just before the concrete is placed.

c. Where foundation piles are used, the excavation of each pit shall be completed to the planned bottom of footing elevation before the piles are driven. After the driving is completed, all loose and displaced material shall be removed, leaving a smooth, solid bed to receive the concrete.

2. Tremie Seal for Foundation

In case of a foundation requiring a tremie seal, material forced above the planned elevation of the bottom of the seal by the driving of the foundation piles need not be removed under ordinary conditions. However, if the underlying soil becomes displaced during the pouring of concrete for the foundation seal and a mud wave is formed thereby, the displaced material shall be removed in order to preserve the full foundation cross section indicated on the Plans.

3. Stability of Foundation

When the foundation, upon excavating to planned grade, completing driving piling, or dewatering cofferdams is not sufficiently stable to receive the concrete or other masonry intended, it shall be the responsibility of the Contractor to stabilize the foundation area or construct bottom form or use other positive and properly engineered solutions so that the concrete footing can be constructed in the dry and to its proper place.

C. Cofferdams

1. Submerged Areas and Cofferdams

Suitable and practically watertight cofferdams shall be used wherever water bearing strata are encountered above the elevation of the bottom of the excavation. The Contractor shall submit drawings and appropriate design calculations prepared and sealed by a Registered Professional Engineer in the State of Maryland showing the Contractor's proposed method of cofferdam construction and other pertinent features not shown in detail on the Plans. The drawings will be reviewed by the County Engineer before construction is started, but the review shall not relieve the Contractor of any of the Contractor's responsibility under the Contract for the successful completion of the facility. The Contractor's attention is directed to the provisions of Section GP-5.02.

2. Cofferdam Sheeting

Cofferdam sheeting for foundation construction shall in general be carried well below the bottom of the footings and shall be well braced. The interior dimensions of cofferdams or cribs shall be such as to give sufficient clearance for the construction of forms and the inspection of their exteriors and to permit pumping outside of the forms. Cofferdams or cribs which are tilted or moved laterally during the process of sinking shall be righted or enlarged so as to provide the necessary clearance, and all such work shall be at the expense of the Contractor.

3. Concrete Foundation Seal

When conditions are encountered which, in the opinion of the County Engineer, render it impracticable to dewater the foundation before placing masonry, the County Engineer may require the construction of a concrete foundation seal of the dimensions as may be necessary and of the thickness needed to resist any possible uplift. The foundation shall then be pumped out and the balance of the masonry placed in the dry. When weighted cribs are employed and the crib weight is utilized to overcome a part of the hydrostatic pressure acting against the bottom of the foundation seal, special anchorage such as dowels or keys shall be provided to transfer the entire weight of the crib into the foundation seal. When a foundation seal is placed under water, the cofferdam shall be vented or ported at low water level as directed.

4. Concrete Protection by Cofferdams

Cofferdams shall be constructed so as to protect green concrete against damage from sudden rising of the stream and to prevent damage to the foundation by erosion. No timber or bracing shall be left in the cofferdams or cribs in a way as to extend into the substructure concrete, without written permission from the County Engineer.

5. Pumping

All pumping from the interior of the foundation enclosure shall be done in a manner as to preclude the possibility of any portion of the concrete materials being carried away. No pumping will be permitted during the placing of concrete, or for a period of at least 24 hours thereafter, unless it is done from a suitable pump separated from the concrete work by a water-tight wall. Pumping to dewater a sealed

cofferdam shall not commence until the seal has set sufficiently to withstand the hydrostatic pressure.

6. Removal of Cofferdams or Cribs

Unless otherwise provided, cofferdams or cribs with all sheeting and bracing involved therewith shall be removed by the Contractor after the completion of the substructure. The removal shall be affected in a manner as not to disturb or mar the finished masonry.

D. Backfilling

1. General

All excavated spaces resulting from structure excavation, not occupied by portions of the permanent work, shall be backfilled with approved material. This backfilling shall be carried to the surface of the surrounding ground or to the finished grades shown on the Plans. The top surface of the backfilled areas shall be neatly graded to prevent ponding of surface water.

2. Backfill Compaction

All backfilled volumes shall be built and compacted as described under the subsequent sections on Embankment and/or Tamped Fill. Note, however, that for backfills in old channels, outside of the cross section of the road; it will be acceptable if material is deposited in the old channel in layers not exceeding 2 feet in thickness; and compaction may be reduced to be equal to that caused by two passes over each layer by heavy compaction or earth moving equipment.

3. Backfilling Against Structures

Backfilling against various structures may be done at the following times:

a) With brick masonry, backfilling may be done seven days after completion of the section. Refer to Section 04200.03 for cold weather protection.

b) With cement concrete structures where the base width is approximately one-half of the height, backfilling may be done after all provisions for curing concrete, etc., have been complied with on reinforced sections (any section not falling in above classification), backfilling may be done after all provisions have been complied with for curing concrete, etc., and when compression test specimens indicate that the concrete has attained a minimum compressive strength of 3000 psi.

In the case where backfilling may be made equally on each side of a single wall or part of a structure without producing stress in that section, backfilling may be done after all the provisions have been complied with for curing concrete.

4. Backfilling Around Piers

Fill placed around piers shall be deposited on both sides to approximately the same

elevation at the same time. All backfilling adjacent to structures shall be deposited in horizontal layers where settlement would be detrimental. All backfill material shall be compacted as prescribed under Tamped Fill. Special care shall be taken to prevent any wedging action against the structure, and all slopes bounding or within the areas to be backfilled shall be stepped or serrated to prevent wedging action.

5. Backfill Bed

In backfilling abutments, retaining walls, or other structures, the bed for the backfill shall be so prepared and serrated and the backfill shall be so built up in horizontal layers that at all times there shall be a horizontal berm of uniformly compacted material behind the structure for a distance at least equal to the height of the abutment or wall remaining to be backfilled, except insofar as undisturbed material protrudes into this area. Each layer of this berm shall be compacted in accordance with Section 02260.03.

The use of drop pile hammers, loaded or unloaded clam shell or other similar unsuitable equipment for compacting backfill within the berm area mentioned above as well as the dropping of any heavy weight for that purpose is prohibited. Jetting of fills or other hydraulic methods involving or likely to involve liquid or semi-liquid pressure within the berm area is prohibited.

02220.04 METHOD OF MEASUREMENT

A. General

RESERVED FOR FUTURE USE

B. Class 3 Excavation

RESERVED FOR FUTURE USE

C. Class 3A Excavation

RESERVED FOR FUTURE USE

D. Class 4 Excavation

RESERVED FOR FUTURE USE

02220.05 BASIS OF PAYMENT

A. General

RESERVED FOR FUTURE USE

B. Structure Excavation

RESERVED FOR FUTURE USE

SECTION 02230

CHANNEL OR STREAM CHANGE EXCAVATION

02230.01 GENERAL

Description

A. Channel or stream change excavation shall include, but not necessarily be limited to, excavation for channels and/or stream changes both within and outside of the limits of the highway or site; the removal and proper utilization or disposal of all excavated materials; and constructing, shaping and finishing of all earthwork involved in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.

2. General excavation; Section 02210.

3. Erosion Control; Sections 02291, 02292, 02293, 02294, and 02295.

C. Quality Assurance

All materials from stream change excavations that are to be incorporated into the work will be subject to test by the County Engineer to determine its suitability for the portions of the work in which the material is to be placed. The tests may determine organic content, mechanical properties, bearing capacity, density, stability, or any other properties pertinent to the satisfactory completion of the work indicated.

D. Submittals

The Developer, for Developer Projects, shall submit copies of Waterway Construction Permits to the County.

02230.02 MATERIALS

A. Materials Furnished by the County

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

B. Contractor's Options

Not used.

C. Detailed Material Requirements

Detailed material requirements shall be as specified in Section 02220.02.

02230.03 EXECUTION

All suitable materials removed from the excavation shall be used, insofar as practicable, in the formation of embankments or shall be otherwise utilized or satisfactorily disposed of as shown on the Plans or as directed by the County Engineer. The completed work shall be in accordance with the established alignment, grades and cross section. During construction, the channel shall be kept drained, insofar as practicable, and the work shall be prosecuted in a neat workmanlike manner and in accordance with Section 02210.03, Article C, Paragraph 1.

02230.04 METHOD OF MEASUREMENT

A. General

RESERVED FOR FUTURE USE

B. Excavation Classification

RESERVED FOR FUTURE USE

C. Measurement

RESERVED FOR FUTURE USE

02230.05 BASIS OF PAYMENT

A. General

RESERVED FOR FUTURE USE

B. Channel or Stream Change Excavation

RESERVED FOR FUTURE USE

SECTION 02240

BORROW EXCAVATION

02240.01 GENERAL

A. Description

Borrow excavation shall include, but not necessarily be limited to, furnishing, excavating, hauling, and depositing of approved materials for embankments and backfills as directed, when sufficient quantities of suitable materials are not available from other onsite excavations, and shall include all work prescribed for backfills, embankments, subgrade and earth shoulders in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.

2. Clearing and grubbing; Section 02110.

3. Trench excavation, backfill, and compaction; Section 02250.

4. Embankment construction; Section 02260.

5. Turf establishment; Section 02820.

C. Quality Assurance

All borrow materials will be subject to test by the County Engineer to determine compliance with these Specifications. When specific materials tests are called for in the referenced standards and specifications, the County Engineer will have the option of requiring that any or all of these tests be performed for materials furnished for a specific project. When testing is required, it will be specified herein or in the "Special Provisions."

D. Submittals

1. Materials Tests

   Materials test results shall be submitted for all materials furnished from other than a licensed commercial operating supplier. The tests shall demonstrate that the material meets all the requirements specified herein.

2. Certificates of Compliance

   Certificates of compliance shall be submitted in accordance with the "General Provisions" for materials furnished from a licensed commercial operating supplier.

The certificate shall state that the material meets the requirements specified herein.

02240.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any borrow material.

B. Contractor's Options

The Contractor may furnish borrow material by one of the following methods:

1. Acquire material from a licensed commercial operating supplier;

2. Make application to the Department of Natural Resources under the Maryland Annotated Code, Article 7, Subtitle 6A, entitled "Surface Mining";

3. Make application to the County to operate under the standard adopted in accordance with the Maryland Annotated Code, Article 7, Subtitle 6A31, entitled "Exemptions" and approved by the Maryland Department of Natural Resources.

A Contractor who elects the use of Option 3 above must submit an application to the County. An exemption under Option 3 will require approval of a reclamation and excavating plan along with the drainage patterns and methods of attaining satisfactory drainage and soil conservation as the work progresses. The plan shall also provide for surface restoration suitable for the proposed subsequent land use after reclamation is completed and the proposed method of accomplishment. Additional information may be deemed necessary which the applicant shall furnish upon request.

The Contractor shall be responsible for obtaining any other state or local permits which may be required in connection with furnishing borrow material.

C. Detailed Material Requirements

1. Type 1 Borrow Excavation shall be in accordance with all the requirements of Section 02260.02.

2. Type II Borrow Excavation shall comply with AASHTO M 145, groups A-3, A-2, A-2-4 or A-2-6. A-3 material shall only be used when the backfill can be contained. (e.g. trench backfill).

3. Type III Borrow Excavation shall be a material which has a minimum 25% retained on the No. 10 sieve and a maximum 10% passing the #200 sieve, a liquid limit determined by AASHTO T 89 no greater than 30 and a plasticity index determined by AASHTO T 90 not greater than 9. The maximum dry density shall not be less than 115 pounds per cubic foot.

02240.03 EXECUTION

A. General

Borrow material shall not be used until provisions have been made for utilization of all

available suitable material meeting the requirements specified herein obtained from on-site excavations.

B. Borrow Pits

1. Clearing and Grubbing

   Clearing and grubbing shall be performed in accordance with Section 02110.03.

2. Borrow Pit Material

   The Contractor shall notify the County Engineer 10 days in advance of the opening of any borrow pit so that soil analysis, elevations, and measurements of the ground may be made. Unless written permission from the County Engineer is given to the Contractor to do otherwise, it is to be understood that after a pit is once opened the material excavated is to be used only for the project intended.

3. Overburden Material

Unsuitable materials and overburden, meeting the requirements of Section 02813.02, shall be disposed of and shall be placed, trimmed, shaped, or sloped as directed by the County Engineer.

4. Approved Materials

   Approved materials provided under this item shall be incorporated in the work in accordance with the requirements of Sections 02250.03, 02260.03, and 02280.03 for the completion of embankment, backfill, sub-grade, and earth shoulders.

5. Borrow Pit After Excavation

   After the necessary quantity of materials has been removed, the borrow pit shall be trimmed and shaped to blend into the general topography of the area so as to present a neat appearance and have all parts effectively drained. Steep slopes and sheer faces shall be avoided. All disturbed areas shall be seeded and mulched at the Contractor's expense in accordance with the approved sediment control plan. These shaping and seeding requirements do not apply to commercial pits.

C. Borrow Excavation Beyond Specified Limits

If, after the Contractor has substantially completed the excavations on site, the County Engineer directs the Contractor to excavate beyond the limits of the Project as originally proposed, then all material removed beyond the limits of the typical cross section, or as indicated by contours or elevations, shall be classified as borrow excavation. All work and payment therefore will be in accordance with the requirements for borrow excavation.

D. Blending Materials

The Contractor will be permitted to mix or blend two or more appropriate materials so as to produce a finished in-place product meeting the specified physical characteristics.

E. Compaction of Borrow Excavation Material

Compaction requirements and the method of determining densities for the above types of borrow excavation shall be in accordance with Sections 02260.01 and 02260.03.

02240.04 METHOD OF MEASUREMENT

A. Original Position Method

RESERVED FOR FUTURE USE

B. Contingent Borrow

RESERVED FOR FUTURE USE

C. Delivery Ticket Method

RESERVED FOR FUTURE USE

D. In-Place Method for Utility Trench Backfill

RESERVED FOR FUTURE USE

02240.05 BASIS OF PAYMENT

A. General

RESERVED FOR FUTURE USE

B. Borrow

RESERVED FOR FUTURE USE

SECTION 02245

SELECTED BACKFILL

02245.01 GENERAL

A. Description

Selected backfill shall include, but not necessarily be limited to, furnishing and placing satisfactory foundation bedding and backfill materials for box culverts, pipes, pipe endwalls, retaining walls, inlets, manholes, steps, concrete gutters, and other structures in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.

2. Structure excavation; Section 02220.

3. Trench excavation, backfill, and compaction; Section 02250.

C. Quality Assurance

All selected backfill material will be subject to test by the County Engineer to determine the material's compliance with these Specifications.

D. Submittals

Certificates of compliance shall be submitted in accordance with the "General Provisions" for all selected backfill material furnished. The certificate shall state that the material meets the requirements specified herein.

02245.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any selected backfill material.

B. Contractor's Options

The Contractor may furnish either stone or slag meeting the material and gradation requirements specified herein, unless otherwise noted and subject to the restrictions indicated in Paragraph O2245.02.C.

C. Restrictions

Only Type II Borrow as specified in Section 02240.02 or ASTM D 2940 designation GA S/B and Maryland designation BRG S/B materials as specified in Section 02621.02 shall be

placed within 1.5 feet of the exterior wall of polyethylene or poly-vinyl chloride pipes.

D. Detailed Material Requirements

Material for selected backfill shall meet the requirements of Maryland designation BRG S/B, ASTM D 2940 designation GA S/B, or AASHTO M 43, size number 57 as specified in Section 02621.02, except as limited in Paragraph 02245.02.B.2 for PVC pipe.

02245.03 EXECUTION

When portions of foundations are lower than the planned bottom of the structure, the bottom shall, if called for by the Contract Documents or directed by the County Engineer, be raised by the placement of selected backfill material. It may be placed with mechanical equipment or manually, depending upon the volume of material involved.

If areas of the foundation are soft, composed of mud, or are in the County Engineer's judgment unfit to receive the pipe, conduit, structure, concrete, or masonry, then such unacceptable material shall be removed and replaced with selected backfill material.

The County Engineer will be the sole judge as to the use of selected backfill for foundation stabilization.

02245.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02245.05 BASIS OF PAYMENT

A. General

RESERVED FOR FUTURE USE

B. Selected Backfill

RESERVED FOR FUTURE USE

SECTION 02246

POROUS BACKFILL

02246.01 GENERAL

A. Description

Porous backfill shall include, but not necessarily be limited to, furnishing and placing granular material against the rear faces of abutments, wings, retaining walls, etc.; including concrete base, drains, etc., all as indicated on the Plans and in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.

2. Underdrain installation; Section 02510.

3. Storm drainage structure installation; Section 02530.

4. Cast-in-place structure construction; Section 03300.

C. Quality Assurance

All porous backfill materials will be subject to test by the County Engineer to determine the materials compliance with these Specifications.

D. Submittals

Certificates of Compliance shall be submitted in accordance with the "General Provisions" for all porous backfill materials furnished. The certificate shall state that the material meets the requirements specified herein.

02246.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any porous backfill material.

B. Contractor's Options

The Contractor may furnish any pipe material specified in this Section, unless otherwise noted.

C. Detailed Material Requirements

1. Porous backfill shall meet the requirements of AASHTO M 43, size number 57 as specified in Section 02621.02.

2. Porous concrete drain pipe shall be as specified in Section 02510.02.

3. Concrete drain tile shall be as specified in Section 02510.02.

4. Vitrified clay pipe and clay drain tile for underdrains shall be as specified in Section 02510.02.

5. Corrugated steel pipe for underdrains shall be as specified in Section 02510.02.

6. Portland cement concrete for drain bases shall be Mix No. 1 as specified in Section 03310.

02246.03 EXECUTION

The porous backfill material shall be carefully placed to the dimensions indicated on the Plans. The material shall be placed in layers in conjunction with the adjacent fill as it is made and compacted. Any fill material removed for placing the porous backfill material shall be at the sole expense of the Contractor. If a form is used between the porous backfill material and the earth backfill, none of it shall remain in the completed fill. The porous backfill may be placed in approved porous bags.

All drains required shall be carefully placed and sloped to drain to weep holes or other points of discharge. If clay drains are used, they shall be carefully placed so as to maintain open joints between units.

Concrete base shall be sloped to drain to points of discharge.

02246.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02246.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE

SECTION 02250

TRENCH EXCAVATION, BACKFILL, AND COMPACTION

02250.01 GENERAL

A. Description

Trench excavation, backfill, and compaction shall include, but not necessarily be limited to, the excavation, backfill, and compaction of trenches for storm drains, water mains, sanitary sewers, and other underground utility systems shown on the Plans, and in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Maintenance of traffic; Sections 01410 through 01470.
2. Protection of the environment; Section 01500.
3. Test pits; Section 02012.
4. Clearing and grubbing; Section 02110.
5. Tree removal and protection; Section 02120.
6. Adjusting and replacing fences, shrubs, hedges, etc.; Section 02130.
7. Protecting and adjusting existing utilities and underground structures; Section 02140.
8. Removal or abandonment of existing utilities and underground structures; Section 02150.
9. Removal of existing pavement, sidewalk, curb, and combination curb and gutter; Section 02160.
10. Tamped fill; Section 02265.
11. Excavation support; Section 02400.
12. Dewatering; Section 02512.
13. Sidewalks; Section 02660.
14. Curb, combination curb and gutter; Section 02670.
15. Patching paving; Section 02680.

16. Salvaging topsoil; Section 02811.

17. Field Test Reports, GP- 6.11.

C. Quality Assurance

1. Materials

   All materials removed from trench excavations and used for backfill will be subject to test by a Geotechnical Engineer obtained by the Contractor to determine the material's suitability for use as backfill. The material may be tested to determine organic content, mechanical properties, density, or any other properties pertinent to the satisfactory completion of trench backfilling.

2. Soil Laboratory and Field Density Tests

   a. The Contractor shall retain a Geotechnical Engineer, a Professional Engineer, registered in the State of Maryland for all soil laboratory and field density testing for the Project. The Geotechnical Engineer, with the concurrence of the County Engineer, shall determine the number of samples to be taken, the location of samples, and the frequency of tests required to confirm compliance with the Specifications. The Contractor shall assist the Geotechnical Engineer in obtaining samples and shall provide a smooth surface for conducting field density tests. The Contractor will not be entitled to any claim for additional compensation due to the testing requirements specified herein.

   b. At the start of the trenching operation, the Contractor shall demonstrate to the Geotechnical Engineer, with the concurrence of the County Engineer, that the compaction density specified in Section 02250.03 can be attained by the compaction equipment and methods the Contractor intends to use. Once the method and equipment has been approved, no substitutions will be permitted without written approval from the Geotechnical Engineer, with the concurrence of the County Engineer. Additional demonstration of the suitability of the compaction equipment and methods will be required whenever there is a change in trench conditions.

   c. Should testing determine that the required density is not being met, or the material is outside the specified moisture range, the Contractor shall, without additional compensation, reexcavate, rework, and/or recompact the particular layer or section until the required density and/or moisture is attained.

D. Submittals

The Contractor shall submit for approval to the Geotechnical Engineer, with the concurrence of the County Engineer, a list of compaction equipment the Contractor intends to use on the project, the recommendations of the equipment manufacturer as to the maximum lift thickness which can be placed, and the method of compaction to be used with this equipment to achieve the required compaction.

E. Soil Testing Reports

The Contractor will provide the County Engineer with soil test results on a bi-weekly basis. Prior to Final Completion Acceptance the contractor shall have the Geotechnical Engineer submit a letter certifying all fill areas have been compacted according to the codes, plans, and specifications as indicated.

02250.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any materials for trench backfill other than those materials which are available from the trench excavation limits as shown on the Standard Details.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. Use and Ownership of Excavated Material

   a. All suitable material excavated from utility trenches shall be used, as far as practicable, for backfill in trenches.

   b. When specifically noted in the contract documents, the Contractor shall properly store, stockpile and protect all materials that are to be reused in the work. The Contractor shall replace, at the Contractor's own expense, material that was suitable when excavated, which has subsequently become unsuitable because of careless, neglectful, wasteful, or unprotected storage. All unsuitable and surplus suitable material, as determined by the Geotechnical Engineer, with the concurrence of the County Engineer, shall be removed from the excavation and disposed of off-site by and at the expense of the Contractor.

2. Borrow

   Borrow material for trench backfill shall meet the requirements of Section 02240.02.

3. Selected Backfill

   Selected backfill for pipe foundation and bedding shall meet the requirements of Section 02245.02.

4. Graded Aggregate Subbase

   Graded aggregate subbase for trench backfill shall meet the gradation requirements specified in Section 02621.02.

5. Bituminous Concrete

   Bituminous concrete for temporary surfacing material shall meet the requirements

specified in Section 02641.02.

02250.03 EXECUTION

A. Surface Preparation

1. Clearing and Grubbing

   a. The Contractor shall clear and grub the surface over the line of the trench in accordance with the requirements of Section 02110.03.

   b. To protect against accidental clogging, sanitary sewer channels in existing manholes shall be covered, as directed by the County or Geotechnical Engineer, with the concurrence of the County Engineer,, prior to any grubbing or grading operations.

2. Removing Pavement, Sidewalk, Curb, etc.

   a. The Contractor shall remove pavement, sidewalk, curb, etc. over the line of the trench in accordance with the requirements of Section 02160.03.

   b. The Contractor shall remove paving only to the width shown on the Standard Details, noted in the Special Provisions, or as directed by the County or Geotechnical Engineer, with the concurrence of the County Engineer,. When the Contractor removes paving for a greater width than is deemed necessary or disturbs paving, sidewalk, curbs, etc. due to settlement, slides, or cave-ins, or in making excavation outside the limits of the trench without written order of the County or Geotechnical Engineer, the County will require the Contractor to replace the excess damaged area. The Contractor shall be responsible for repaving or surfacing roadbeds or sidewalk, curbs, etc. that have failed, settled, or have been damaged at any time before expiration of the Contract maintenance period due to work or any other activities by the Contractor, the Contractor's subcontractors, or suppliers.

3. Removing Street Signs, Fences, Shrubs, Trees, and Other Improvements

   a. The Contractor shall remove improvements from the working strip in accordance with the requirements of Section 02130.03.

   b. In addition to the requirements contained in Sections GP-7.15 and GP-7.17 the following shall apply:

      1) Existing fences shall be carefully removed to the extent required to permit construction operations and as directed by the County Engineer. The Contractor shall safely store all elements during the time that they are down.

      2) Shrubs, hedges, and trees shall be transplanted with sufficient earth to insure that no damage to the root system occurs. General reference is made to Section 02860.03 for acceptable planting methods. After transplanting has been accomplished, it shall be the

Contractor's responsibility to water all plants. The transplanting of trees will only be required when indicated on the Plans.

4. Maintaining Traffic

The Contractor shall furnish all labor, tools, equipment, and materials specified in Sections 01410 through 01470 for the maintenance of traffic during construction.

B. Trench Excavation

1. General

a. Excavation for the installation of utilities shall be unclassified and shall consist of the excavation of all material encountered to the lines, grades, and sections shown on the Plans and/or the Standard Details, as specified, or as directed by the County or the Geotechnical Engineer.

b. Trenches may be excavated and backfilled either by hand or by machinery as the Contractor may elect. The Contractor shall have no claims, nor will extra compensation be allowed, for hand excavation or backfill which may be required by these Specifications or by the County or Geotechnical Engineer for protection of existing utilities or structures.

c. Ground profiles shown on the Plans represent the elevations along the centerline of the street for all work in streets and along the centerline of the trench for work not in streets.

2. Protection of Property and Structures

The Contractor shall, at the Contractor's own expense, sustain in place and protect from direct or indirect injury all existing facilities in the vicinity of the excavation, whether above or below the ground, or that may appear in the trench. The Contractor shall be responsible for the implementation of protective measures associated with the presence or proximity of pipes, poles, tracks, walls, buildings, property markers, and other structures and property of every kind and description in or over the Contractor's trenches or in the vicinity of the Contractor's work whether above or below the surface of the ground. The Contractor shall be responsible for all damage and assume all expense for direct or indirect injury caused by the Contractor's work, to above ground facilities or below ground facilities shown on the Plans.

3. Utility Adjustments

a. All adjustments to utilities other than those owned by the County, shall be performed by the utility owner.

b. It shall be the responsibility of the Developer to perform all adjustments to existing water/sewer utilities at their expense. Adjustments to water services between the property line and the water main shall be performed by qualified Utility Contractors. Adjustments between the property line and the house shall be performed under the supervision of a Registered Master Plumber.

c. Adjustments to sanitary sewers within the County right-of-way may be accomplished by either a qualified Utility Contractor or registered Master Plumber. Adjustments to sanitary sewers outside the County right-of-way shall be performed under the supervision of a Registered Master Plumber.

d. It shall be the contractor's responsibility to obtain all permits necessary for the performance of this work, along with obtaining all County approvals.

4. Obstructions Shown on Plans

a. Certain information regarding the reputed presence, size, character, and location of existing underground utilities and structures has been shown on the Plans based upon available records. There is no certainty of the accuracy of this information, and it shall be considered by the Contractor in this light. If test pit data is not shown on the Plans, the Contractor shall excavate test pits in advance of the Contractor's work in accordance with Section 02012 to locate existing utilities. The Contractor shall hereby distinctly understand that the County is not responsible for the correctness or sufficiency of the information given. The Contractor shall have no claim for delay or extra compensation on account of incorrectness of information given, or on account of the insufficiency or absence of information regarding obstructions. The Contractor shall have no claim for relief from any obligation or responsibility under the Contract in case the location, size, or character of any underground facility is encountered that is not shown on the Plans.

b. It shall be the responsibility of the Contractor to notify "MISS UTILITIES," all municipal utilities, all pipe line owners, and any other parties affected prior to the beginning of work.

5. Removing Obstruction

a. Should the position of any pipe, conduit, or other structure above or below ground be such as, in the opinion of the County Engineer, to require its removal, realignment, or change due to the work to be done under the Contract, the work of removal, realignment, or change will be done as extra work, or will be done by the owner of the obstructions without cost to the Contractor; but the Contractor shall uncover and support the structures in the limits of the Contractor's trench at the Contractor's own expense before such removal, and before and after such realignment or change. Whether the obstruction is shown on the Plans or not, the Contractor shall not be entitled to any claim for damage or extra compensation on account of the presence of said structure or on account of any delay in the removal or rearrangement of the same.

b. The Contractor shall break through and reconstruct if necessary, the invert or arch of any sewer, culvert, or conduit that may be encountered if said structure is in such position in the judgment of the County Engineer as not to require its removal, realignment, or complete reconstruction. The reconstruction shall not interfere with the flow through the conduit.

c. In the event that obstructions would delay the work of pipe installation, the

Contractor will be permitted to leave a gap in the work and return to fill the gap after the obstructions have been removed. The installation shall be completed by laying full pipe lengths and appropriate closure pieces.

d. The Contractor shall not interfere with any persons, firms, or corporations or with the County in protecting, removing, changing, or replacing pipes, conduits, poles, or other structures.

e. In the event that the County has entered into any agreement with an affected utility owner or owners which will have an effect on operations or financial responsibilities of the Contractor, the requirements of these agreements will be included in the Special Provisions of the Contract.

6. Change of Trench Location

RESERVED FOR FUTURE USE

7. Width and Depth Trenches

a. Trenches shall be excavated to the necessary width and depth as may be shown on the Plans or Standard Details, as specified in the Special Provisions, or as directed. The trench subgrade shall be such as to provide a uniform and continuous bearing and support for the pipe on solid undisturbed earth for the full length of each pipe, except for that portion at the bell hole. Any part of the bottom of the trench excavated below subgrade shall be backfilled with approved material, thoroughly compacted.

b. Subgrade, in the case of pipe lines, shall be the underside of the barrel of the pipe, where the pipe is laid on a natural foundation, or the bottom of granular bedding or concrete foundation, where indicated on the Plans or Standard Details, and the underside of ribs or sills where the pipe is installed on a timber foundation. For appurtenant concrete or masonry structures, subgrade shall be termed the underside of the masonry, or gravel base, or fill material as shown on the Plans or Standard Details.

c. Trench sides shall be vertical to a distance of at least 1 foot above the top of the pipe. Above this point, the remainder of the trench shall be practically plumb when located in paved roadway rights-of-way. In easement areas, the side of the trench from 1 foot above the top of the pipe to the existing ground surface may be sloped or cut-back, subject to the approval of the County or Geotechnical Engineer.

d. Bell holes shall be excavated in the bottom of the trench whenever necessary to permit the proper making of joints.

e. When a pipe, structural plate pipe, or pipe arch is to be installed on existing ground on or under fill, the embankment shall be constructed to a height of at least 9 inches above but not more then 3 feet above the top of pipe and then a trench excavated to receive the pipe.

f. Excavations for concrete encased electric duct banks shall be sufficiently wide to allow placement of ducts and spacers and to allow placement of

forms for the concrete encasement on the sides of the duct banks, if required by site conditions.

g. Where sheeting or trench boxes are used, the maximum width below the top of the pipe, as prescribed above, shall be measured between the interior faces of the sheeting as driven, or inside face of trench box, but in no case shall stringers or nailing strips be so placed as to interfere with the proper ramming of earth under and around the pipe. In case the sheeting, or trench box does not extend below a point 6 inches above the pipe as installed, the maximum width allowed shall be measured between the faces of the excavation below the bottom of the sheeting or box.

8. Length of Open Trench

The Contractor shall not excavate more trench in any day than can be completed (facility installed and trench backfilled) in the same day, unless by written permission of the County Engineer. The County or Geotechnical Engineer shall be empowered at any time to require the backfilling of open trenches over completed pipe lines if, in the County or Geotechnical Engineer's judgment, such action is necessary; and the Contractor shall thereby have no claim for extra compensation, even though to accomplish said backfilling, the Contractor is compelled temporarily to stop excavation or other work at any place.

If work is stopped on any trench for any reason except by order of the County Engineer, and the excavation is left open for 48 hours in advance of construction, the Contractor shall, if so directed, backfill such trench at the Contractor's own cost, and shall not again open said trench until the Contractor is ready to complete the structure therein. If the Contractor shall refuse or fail to backfill such trench completely within 48 hours after said notice, the County Engineer is authorized to have the trench backfilled; and the County will charge the expense thereof to the Contractor and retain the same of any monies due or to become due to the Contractor under the Contract.

The excavation of all trenches shall be fully completed at least one full pipe length in advance of pipe installation, unless otherwise authorized.

9. Responsibility for Condition of Excavation

The Contractor shall be responsible for the condition of all excavations made by the Contractor. All slides and caves shall be removed without extra compensation.

10. Trench Support

a. The Contractor shall support the sides and ends of all excavations wherever necessary with braces, sheeting, shoring or stringers, trench boxes, or other acceptable excavation support systems. All timbering shall be installed by men skilled in such work and shall be so arranged that it may be withdrawn as backfilling proceeds, without injury to the utility or structure constructed or to any roadbed or adjacent structure or property.

b. All work shall be performed in accordance with the latest OSHA requirements.

c. All timbering in excavations, trench boxes, or excavation support systems shall be withdrawn as the backfilling is being done, except where and to such extent as the County Engineer shall order in writing that said timbering or excavation support system be left in place or where the County Engineer permits the trench support to be left in place at the Contractor's expense and upon the Contractor's request. The Contractor shall cut off any sheeting left in place 2 feet below finished grade and shall remove the material cut off without compensation therefore.

d. Wherever necessary, in running sand, or soft ground, or for the protection of any structure or property, sheeting shall be driven without extra compensation to such a depth below the bottom of the trench as may be required or directed.

e. The support of the trench shall be the sole responsibility of the Contractor.

11. Drainage and Dewatering

a. The Contractor shall grade the site as necessary to prevent surface water from flowing into the trench or other utility excavations and shall provide all necessary temporary surface drainage and keep the same operating to the satisfaction of the County or Geotechnical Engineer until permanent drainage or finished grading and permanent surface stabilization has been completed. Damming or ponding of water in gutters or storm drains will not be permitted.

b. It shall be the Contractor's responsibility to adequately control water that may be present in the excavation. The Contractor shall provide for the disposal of water removed from excavations in such a manner not to cause damage to public or private property or to any portion of the work completed or in progress or cause any impediment to the use of any area by the public; nor shall the Contractor discharge any flushing or ground water or any material of any nature into existing sanitary sewer system during the construction of the facilities. All water shall be discharged through an approved sediment control device. The costs of dewatering trench excavations will not be paid for directly, but will be included in prices bid for other related items.

12. Tunneling and Jacking

a. Unless otherwise indicated, excavation shall be by open cut, except that short sections of a trench may be tunneled, or the pipeline jacked, if, in the opinion of the County Engineer, the pipe, cable, or duct can be safely and properly installed.

b. In addition to the requirements contained in Section 02920.03, the following shall apply:

Tunnels for installing pipelines or other utilities shall be of sufficient size to allow, at all points, the proper joining of pipes and the proper compacting of the refill around them. Tunnels shall be timbered or lined where and to such extent as may be necessary to support the tunnel in accordance with

accepted methods. All methods of tunneling used shall be subject to the approval of the County Engineer, however, the safety of the tunnel construction and the protection, repair, or replacement of the tunneled obstruction shall be the sole responsibility of the Contractor.

c. Jacking or boring pipe shall be in accordance with the requirements of Section 02910.03.

d. No extra payment beyond that made for trench excavation and backfill will be made for tunnels or jacking pipe under trees, sidewalks, curbs, pipelines, or similar obstructions.

C. Foundation Preparation

1. General

The Contractor shall complete the excavation as far as practicable to the neat lines shown on the Standard Details or Plans or as directed by the County or Geotechnical Engineer.

2. Excavation Below Subgrade

a. The Contractor shall, without additional compensation, before any pipe or appurtenance is installed, fill all unauthorized depressions or irregularities in the bottom of the trench or tunnel with firmly compacted embankment or other approved material.

b. Where the bottom of the trench, at subgrade, is in unstable or unsuitable material, excavation shall be carried to such depth as recommended by the County or Geotechnical Engineer. The trench bottom shall be restored to subgrade with Selected Backfill.

D. Class 3A Excavation

Class 3A Excavation shall include removal of unsuitable material when encountered at or below trench subgrade. It shall also include increases or decreases in the limits or amounts of excavation resulting from changes in pipe grade or location as previously described.

E. Backfill, Compaction, and Maintenance of Backfilled Trench

1. Backfill

a. The Contractor shall backfill all trenches as rapidly as practicable after the installation of the utility therein, or after the excavation has served its purpose.

b. Backfill material around and over pipelines for a distance of 2 feet above the top of pipe shall consist of clean unfrozen earth, free of ash, putrescible refuse, large stones, or other material of an unsatisfactory character as may be determined by the County or Geotechnical Engineer. Backfilling shall

commence by depositing and then compacting by hand operated mechanical tampers suitable material in layers not more than 6 inches thick, measured loose, under, around, and over the pipe to a point not less than 1 foot in depth over the top thereof.

c. The remainder of the trench may be backfilled in layers not exceeding the maximum limits determined by equipment and methods demonstrated in compliance with Paragraph 02250.01.C.2. However, if the demonstration lift thickness is followed and the specified compaction is not obtained based on the County or Geotechnical Engineer's testing during backfilling, the Contractor shall, at the Contractor's own expense, remove, replace, and retest as many times as is required to obtain the specified compactions. In backfilling the remainder of the trench, stones of not more than 6 inches in largest dimension which have been taken out in excavating may be mixed with earth in an amount not exceeding 25% of the backfill volume. Stones of larger size or in greater quantities shall not be used, unless directed by the County or Geotechnical Engineer. The Contractor shall not permit excavations to be used for the disposal of refuse.

d. In paved areas, the Contractor shall furnish and backfill the top foot of trench below the pavement base course with graded aggregate subbase.

e. Backfill over arches and pipe arches shall be placed uniformly on both sides of the arch so as to load the arch uniformly and symmetrically. For structures without headwalls, backfill shall be commenced in the center of the structure. If the structure includes headwalls or spandrel walls, backfilling operation may commence at one wall and extend toward the opposite side, care being taken in all cases to bring embankment or sections thereof up evenly on each side to a height of not less than 18 inches above top of structural plate pipe structures.

f. The Contractor, without extra compensation, shall take whatever special precautions are necessary in the placing and tamping of backfill around the sides of non-rigid pipe to insure that allowable deflections will not be exceeded.

g. Should additional material be required for backfilling in excess of that obtained from excavation, the Contractor shall obtain Borrow material from off-site sources, to complete the trench backfill.

2. Compaction

a. The Contractor shall, in unimproved areas outside the public rights-of-way, compact each trench backfill layer in such a manner as to obtain a dense backfill free of voids and not susceptible to undue settlement or depression. Trench backfill extending to not less than I foot in depth above the top of pipe shall be compacted to at least 92% of maximum density at a moisture content within 3% of the optimum in accordance with AASHTO T 180.

b. Trench backfill within all public rights-of-way and improved, or paved areas shall be compacted to at least 92% of maximum density at a moisture content within 2% of the optimum moisture in accordance with AASHTO T

180. The final 1 foot of trench backfill to pavement subgrade shall be compacted to at least 97% of maximum density at a moisture content within 2% of the optimum in accordance with AASHTO T-180.

c. The Contractor will arrange for compaction density testing as specified in Section 02250.01.

d. In-place soil density tests shall be performed horizontally every 150 linear feet, or fraction thereof, and vertically every other 8 inch lift with the compacted thickness not to exceed 16 inches.

e. Trench backfill for water and sewer laterals shall be tested for in-place soil density with a minimum of one density test per each lateral. Backfill around manholes, valves, or other structures shall be tested for in-place soil density with a minimum of one test every 3 vertical feet. The test locations for manholes shall be within 3 feet of the structure. For water and sewer valve clusters, the tests shall be conducted in the center of the cluster.

3. Maintenance of Backfilled Trench

a. The Contractor shall maintain, at the Contractor's own expense, all backfilled trenches in acceptable condition.

b. If the Contractor fails to fill depressions in the backfilled trench within 24 hours after the receipt of written notice from the County Engineer, the County Engineer may refill said depressions and the cost thereof shall be retained from any monies due the Contractor, under the Contract. In case of emergency, the County Engineer may refill any dangerous depression or protect with lights wherever necessary without giving previous notice to the Contractor; and the cost of so doing shall be retained

TRENCH EXCAVATION, BACKFILL, AND COMPACTION 02250-12

from any monies due or to become due the Contractor under the Contract.

c. The contractor shall be responsible for any injury or damage that may result from lack of maintenance of any refilled excavation at any time prior to acceptance of the Project.

d. The Contractor shall furnish the County Engineer with names, addresses, and telephone numbers of at least 2 members of the Contractor's organization that may be contacted in an emergency.

F. Restoration

1. General

After the completion of backfilling, all materials not used therein shall be removed and disposed of in such a manner and at such point or points as shall be approved or directed by the County or Geotechnical Engineer; and all roads, sidewalks, and other places on the line of the work shall be left free of debris, clean, and in good order. Said cleaning-up shall be done by the Contractor without extra

compensation; and if the Contractor shall fail to do such work within 1 week after receipt of notice, the County Engineer may arrange to have the cleaning-up done by others; and the cost shall be retained out of the monies due or to become due to the Contractor under the Contract.

2. Paved Areas

   a. Immediately upon completion of the trench backfill and compaction as previously specified, the Contractor shall temporarily fill the trench to within 2 inches of finished grade with graded aggregate subbase. The remaining 2 inches of trench shall be filled with a temporary surfacing material in accordance with Section 01470. Temporary surfacing material shall be either graded aggregate subbase or bituminous concrete as specified by the County or Geotechnical Engineer.

   b. For graded aggregate subbase temporary surfacing, weather permitting, the Contractor shall remove and dispose of the temporary surfacing materials, cut-back the edge of the existing pavement as shown on the Standard Details, and patch-pave the area as specified in Section 02680.03 within 30 calendar days after the backfilling and compacting the trench.

3. Concrete Improvements

   Sidewalks, curbs, combination curb and gutter, driveway aprons, and other concrete improvements removed or damaged by the Contractors activities shall be replaced by the Contractor in accordance with Sections 02651.03, 02660.03, 02670.03, or as directed by the County Engineer.

4. Non-paved Areas

   a. Immediately upon completion of the trench backfill and compaction as previously specified, the Contractor shall temporarily stabilize the area in accordance with the requirements of Section 01500.

   b. Weather permitting, within 14 days after the completion of trench backfill and compaction, the Contractor shall permanently stabilize the area with seeding and mulching or sodding, as appropriate, as specified in Sections 02812.03 through 02850.03.

5. Street Signs, Fences, Shrubs, Trees, and Other Improvements

   In addition to the requirements contained in Section GP-7.15, the following shall apply:

   a. Existing street signs and traffic control devices stored or relocated by the Contractor will be reset by the County after construction in the area is complete and the work accepted by the County Engineer.

   b. Fences shall be re-erected by the Contractor at locations designated by the County Engineer. Materials not capable of being reerected through no fault of the Contractor shall be replaced on a force account basis as provided for the "General Provisions" for materials only.

02250.04 METHOD OF MEASUREMENT

A. Trench Excavation

RESERVED FOR FUTURE USE

B. Class 3A Excavation

RESERVED FOR FUTURE USE

02250.05 BASIS OF PAYMENT

A. General

RESERVED FOR FUTURE USE

B. Trench Excavation, Backfill, and Compaction

RESERVED FOR FUTURE USE

SECTION 02260

EMBANKMENT

02260.01 GENERAL

A. Description

1. Embankment shall be formed of suitable material obtained from General, Structure, Borrow, Trench, and other excavations included in the Project, and it shall be placed, processed and compacted to the lines and grades shown on the Plans and in accordance with the Contract Documents.

2. In addition to the requirements contained herein, all embankment construction shall be in compliance with the latest version of the Charles County "Grading Ordinance".

B. Related Work Included Elsewhere

1. Protection of the Environment; Section 01500.

2. General Excavation; Section 02210.

3. Structure Excavation; Section 02220.

4. Borrow Excavation; Section 02240.

5. Trench Excavation; Section 02250.

6. Tamped Fill; Section 02265.

C. Quality Assurance

1. Materials

   All embankment materials will be subject to test by a Geotechnical Engineer, a Professional Engineer registered in the State of Maryland, retained by the Contractor, to determine the material's compliance with these Specifications. When specific material tests are called for in the referenced standards and specifications, the County Engineer will have the option of requiring that any or all of these tests be performed for materials furnished for a specific project. When testing is required, it will be specified herein or in the "Special Provisions."

2. Field Tests

   a. The Contractor shall retain a Geotechnical Engineer for all in-place moisture/density testing on the Project. The Geotechnical Engineer shall determine the number of samples to be taken and the frequency of tests

required to confirm compliance with the Specifications with concurrence of the County Engineer. The Contractor shall assist the Geotechnical Engineer in obtaining samples and shall provide smooth surface for conducting moisture/density tests.

The method for testing materials shall be in accordance with the requirements of AASHTO T 180, Method C or D or as determined by the Geotechnical Engineer with concurrence of the County Engineer.

The Contractor shall provide a cement concrete compaction block having dimensions 18 x 18 x 9 inches and weighing not less than 200 pounds. One 18 x 18-inch working face shall have a level broomed surface.

b. At the start of embankment construction, the Contractor shall demonstrate to the Geotechnical Engineer and the County Engineer that the compaction density specified in Section 02260.03 can be attained by the compaction equipment and methods the Contractor intends to use. Once the method and equipment has been approved, no substitutions will be permitted without the Geotechnical Engineer's or County Engineer's approval.

c. Should testing determine that the required density is not being met, or the material is outside the specified moisture range, the Contractor shall, without additional compensation reexcavate, re-work, and/or recompact the particular layer or section until the required density and moisture are attained.

D. Submittals

1. Materials Tests

Material test results shall be submitted for all materials furnished from other than a licensed commercial operating supplier. The tests shall demonstrate that the material meets all the requirements specified herein.

2. Certificates of Compliance

Certificates of compliance shall be submitted in accordance with the "General Provisions" for materials furnished from a licensed commercial operating supplier. The certificates shall state that the material meets the requirements specified herein.

3. Test Results

The Contractor shall have the Geotechnical Engineer submit copies of all laboratory and field soil related test results to the County prior to Final Inspection.

02260.02 MATERIALS

A. Material Furnished by the County

The County will not furnish any materials for embankment construction except as is available on the site within the limits as designated on the Plans by sections, gradelines,

and/or contour lines.

B. Contractor's Options

The Contractor may use suitable materials obtained from general, structure, borrow, trench, and other excavations for the construction of embankments.

C. Detailed Material Requirements

Material for fills or backfills may be from on-site excavations (if of proper quality) or from borrow sources. The material shall be free from vegetable matter, organic material, sludge, grit, trash, muck, roots, logs, stumps or frozen material and other deleterious substances. Except as otherwise specified or approved, the material shall not contain rocks or lumps larger than six inches in greatest dimension. The material shall not contain mica in quantities which, in the judgement of the Geotechnical Engineer with the concurrence of the County Engineer are sufficient to affect compaction characteristics. Materials having a maximum dry density of less then 100 pounds per cubic foot (AASHTO T 180) shall not be used unless specifically approved in writing by the Geotechnical Engineer with the concurrence of the County Engineer. Cinders, ashes, rubble and construction debris shall not be used in the work.

Suitable material is any material meeting the quality requirements specified above and which is not frozen and which has a suitable moisture content.

Unsuitable material is any material not meeting all the requirements for suitable material.

02260.03 EXECUTION

A. General

1. Embankment Foundation

   Prior to the construction of any embankment, the foundation upon which it is to be built shall be properly prepared. Debris, root mat, muck, and other material, which in the judgment of the Geotechnical Engineer with the concurrence of the County Engineer will not adequately support the embankment, shall be removed to the depth specified by the Geotechnical Engineer with the concurrence of the County Engineer. Sod and topsoil may also be ordered to be removed by the Geotechnical Engineer with the concurrence of the County Engineer.

2. Embankment Over Existing Road

   When the embankment is to be superimposed upon any type of existing road, the existing surface, regardless of depth of embankment to be placed thereon, shall be scarified, thoroughly broken up, or removed as shown on the Plans, to a degree as will provide ample bond between the old and new material.

3. Test Rolling

   When test rolling is specified or before any embankment material is placed, the County Engineer may also require that the foundation be tested by being rolled with a pneumatic tired compactor.

4. Frozen Material

No frozen material shall be placed in embankments. Any material which freezes after being placed in the embankment shall be reworked or removed before the next layer is placed. Any frozen material removed from embankments shall be stockpiled outside of construction limits and reserved for future use at a time when its condition is satisfactory to the Geotechnical Engineer with the concurrence of the County Engineer at no expense to the County. Any suitable material which is wasted shall be replaced by the Contractor with other acceptable material at no expense to the County.

B. Placing and Spreading

1. Placing and Spreading

The material shall be placed in horizontal layers of uniform thickness. as outlined in the "Grading Ordinance" or as determined by the Geotechnical Engineer with the concurrence of the County Engineer. Each layer shall be carried across the full width of the embankment. In order to obtain the required density, blending of variable soils may be necessary.

2. Placement Across Water or Unstable Ground

When embankment is to be constructed across open water, liquefied areas or across low swampy ground which 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 or as determined by the Geotechnical Engineer with the concurrence of the County Engineer. Subsequent layers shall be placed and processed in accordance with the requirements noted herein for the type of material being placed.

3. Earth Embankments

In earth embankments no layer shall exceed 8 inches in uncompacted thickness, except as noted in the above paragraph.

4. Rock Embankments

In rock embankment the thickness of layers shall be determined by the size of the rock but in no case shall layers exceed 24 inches in thickness. The portion of the embankment less than 6 feet below the subgrade at the profile grade line shall be placed in layers of more than 8 inches in loose thickness, and these layers shall be filled solid and fully choked with spalls, rock dust, or earth so as to reduce voids to a minimum. Each layer shall be filled and compacted before the next layer is placed.

The top of the rock material in any embankment shall be of a uniform surface, determined by connecting with straight lines the points on the typical cross section which are 9 inches below any median ditch invert and 9 inches below the bottom of each pavement edge (not including foundation layers or subbase) and thence sloping downward and outward under the shoulder at the rate of 3/4 inch per foot to the outer slope of the embankment. The remaining upper portion of the

embankment, unless otherwise specified, shall be constructed of suitable earth, free from stones that would be retained on a 3 inch sieve, and it shall be processed as described herein.

5. Drainage

A smooth grade having an adequate crown shall be maintained so as to provide drainage at all times.

6. Side Slopes

Side slopes shall be uniformly constructed and maintained at the specified slope ratio throughout the progress of the work.

7. Benching

When the 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 or as determined by the Geotechnical Engineer with the concurrence of the County Engineer. The benching operation shall be done as the embankment is brought up in layers. Benching shall be of sufficient width to permit operations of placing and compacting equipment but shall have 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 recompacted along with the new embankment material at the Contractor's expense.

Side-hill benching and embankment construction shall be a continuous operation. Interruption of operation due to unforeseen circumstances shall not be for more than 48 hours. Construction of side-hill fill benches and recompaction of material cut from benches will not be a separate pay item but will be considered incidental to and included in the prices bid for the various excavation items.

C. Moisture Control

When necessary, each layer before being compacted shall be processed as required in order to bring its moisture content sufficiently close to optimum to make possible its compaction to the required density. The material may be wetted by the application of water or dried by plowing, discing, and aerating. Either process may be carried out either on the embankment or at the source of the material. The moisture content of the soil being compacted shall be considered as being too high to insure compaction when, if after repeated aeration and rolling, the roller picks up excessive material, causes deep rutting, or displaces rather than compacts the material. The resultant moisture content of embankment material, when finally compacted to required density, shall not be in excess of two percentage points from optimum or as determined by the Geotechnical Engineer with the concurrence of the County Engineer.

D. Compaction

1. General

Each layer shall be uniformly compacted to the specified density before the new layer is placed and processed. The specified density shall be obtained by rolling with pneumatic tired compaction equipment, grid rollers, three-wheeled power rollers, vibratory, sheepsfoot or tamping rollers, or other approved types of rollers or compaction equipment. Any one or more of these types of equipment shall be used if needed in order to obtain the specified density.

Dumping and rolling areas shall be kept separate, and no lift shall be covered by another until density complying with the requirements of this subsection is secured. Hauling and leveling equipment shall be so routed and distributed over each layer of the fill in a manner as to make use of compaction effort afforded thereby.

Rolling shall be done in a longitudinal direction along the embankment and shall generally begin at the outer edges and progress toward the center. The travel paths of traffic and construction equipment shall be kept dispersed over the entire width of the embankment so as to aid in obtaining uniform compaction.

2. Density Requirements

a. Optimum moisture and maximum density will be determined in accordance with AASHTO T 180, Method C or D as directed by the Geotechnical Engineer with the concurrence of the County Engineer.

b. In-place density will be determined in accordance with MSMT 350 or 352.

c. Roadway and Paved Areas

Material one (1) foot below the top of subgrade shall be compacted to not less than 92 percent of the maximum dry density. Material in the top one (1) foot shall be compacted to not less than 97 percent of the maximum dry density. The resultant moisture content of embankment material, when finally compacted to the required density, shall be within two (2) percentage points of optimum.

d. Non Roadway Areas

Embankment material shall be compacted to not less than 90% of the maximum dry density unless otherwise specified by the Geotechnical Engineer with the concurrence of the County Engineer.

3. Protection of Structures and Utilities During Compaction

Adjacent to structures or utilities and in locations where working space is too restricted to permit the use of rollers, compaction may be obtained by the use of mechanical tampers or vibratory compactors as described under and in accordance with the terms of Section 02265.03. The material to be compacted shall be selected to meet the requirements of this Section except that rock shall not be used. It shall be spread in layers having a loose depth not in excess of 6 inches and shall be compacted to the specified density.

The Contractor shall be responsible for protecting all structures and utilities from any damage which might be caused by the type of equipment used or its method

of operation in the handling, processing, or compacting of embankment or backfill material. Particular care shall be exercised in the vicinity of arches, retaining walls, foundation walls, culverts, and utility trenches to assure that no undue strain or movement is produced.

E. Stability of Embankments

The Contractor shall be responsible for the stability of all embankments in the Contract. The Contractor shall remove and replace with acceptable material any embankment or portion thereof which has been constructed with unapproved material. The Contractor shall bear the expense of removing and replacing unstable material as well as removing and replacing portions of the embankment which become unstable or displaced as the result of carelessness or negligence on the Contractor's part.

Embankment material which may be lost or displaced as a result of natural causes such as storms, cloudbursts, etc., or as a result of unavoidable movement or settlement of the ground or foundation upon which the embankment is constructed shall be replaced by the Contractor with acceptable material from excavation or borrow, etc.

F. Roadway Subgrade

The roadway and paved area subgrade shall be constructed and carefully shaped to the specified cross section after all embankment and backfilling have been substantially completed. Material is to be reserved for use from the sources from which the embankment material is being supplied or may be furnished from borrow if so directed by the County Engineer.

After the subgrade in cuts and fills has been finally shaped and brought to the specified cross section, it shall be carefully and thoroughly proof rolled by the use of a 35 ton pneumatic tire roller or County approved equal.

In locations where rolling is not feasible, compaction by mechanical tampers or vibratory compactors, in accordance with Section 02265.03, may be required.

The compacting shall cover the entire width of the roadway or paved area. The travel paths of any traffic or construction equipment which is permitted on the subgrade shall be kept dispersed so as to aid in obtaining uniform compaction and avoid the displacement of material or formation of ruts. If ruts 2 inches or more in depth are formed, they shall be removed by scarifying, reshaping, and recompacting the affected subgrade area.

The Contractor shall at all times maintain ditches and drains along the subgrade which are adequate to keep it thoroughly drained.

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

02260.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02260.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE

SECTION 02265

TAMPED FILL

02265.01 GENERAL

A. Description

Tamped fill shall include, but not necessarily be limited to, compacting embankment and backfill materials by means of mechanical tampers or vibratory compactors as directed by the Engineer and in accordance with the Contract Documents. This method of compaction shall be used wherever embankment and backfill materials cannot be adequately compacted by other approved methods. This item does not include the furnishing of the embankment or backfill material.

B. Related Work Included Elsewhere

1. Trench excavation, backfill, and compaction; Section 02250.

2. Embankment construction; Section 02260.

C. Quality Assurance

1. Materials

   All tamped fill materials will be subject to test by the Geotechnical Engineer, a Professional Engineer registered in the State of Maryland, to determine the material's compliance with these Specifications. When specific materials tests are called for in the referenced standards and specifications, the County Engineer will have the option of requiring that any or all of these tests be performed for materials furnished for a specific project. When testing is required, it will be specified herein or in the "Special Provisions."

2. Field Test

   a. The Contractor shall retain a Geotechnical Engineer for all in-place moisture/density testing on the Project. The Geotechnical Engineer with the concurrence of the County Engineer shall determine the number of samples to be taken and the frequency of tests required to confirm compliance with the Specifications. The Contractor shall assist the Geotechnical Engineer in obtaining samples and shall provide a smooth surface for conducting moisture/density tests. The Contractor will not be entitled to any claim for additional compensation due to the testing requirements specified herein.

   b. At the start of tamped fill construction, the Contractor shall demonstrate to the Geotechnical Engineer with the concurrence of the County Engineer that the compaction density specified in Section 02260.03 can be attained by the

compaction equipment and methods the Contractor intends to use. Once the method and equipment has been approved, no substitutions will be permitted without the County Engineer's approval.

c. Should testing determine that the required density is not being met, or the material is outside the specified moisture range, the Contractor shall, without additional compensation, reexcavate, rework, and/or recompact the particular layer or section until the required density and moisture are attained.

C. Detailed Material Requirements

Embankment and backfill material used for tamped fill shall meet the requirements of Section 02260.02.

D. Submittals

The Contractor shall have the Geotechnical Engineer submit copies of all laboratory and field soil related test data to the County prior to Final Inspection.

02265.02 MATERIALS

A. Material Furnished by the County

The County will not furnish any materials for tamped fill.

B. Contractor's Options

The Contractor may use suitable materials obtained from general, structure, borrow, trench, and other excavations for the construction of tamped fill.

02265.03 EXECUTION

A. General

After permission has been given by the County Engineer to backfill, the areas to be tamped shall be filled with approved materials furnished from excavation and supplemented by additional approved material, if directed, from borrow excavation. This material shall be placed in horizontal layers not over 6 inches in loose depth or as determined by the Geotechnical Engineer with the concurrence of the County Engineer over the entire area to be tamped and uniformly compacted by means of mechanical tampers or vibratory compactors so as to meet the requirements of Section 02260.03. If the material is too dry for proper compaction, it shall be moistened as necessary to achieve optimum compaction density.

B. Backfilling Around Structures

In backfilling abutments, retaining walls, culverts, foundations, or other structures, special care shall be taken to prevent any wedging action against the structure by the material being compacted; and existing slopes to be filled against shall be benched or stepped. The backfill shall then be built up in horizontal layers as described above and wide enough that there shall be a horizontal berm of thoroughly compacted material being the structure at all

times for a distance at least equal to the height of the structure remaining to be backfilled, except insofar as undisturbed material cannot be adequately compacted by other methods. In the case of structures 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.

02265.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02265.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE

SECTION 02270

TRIMMING EXISTING DITCHES

02270.01 GENERAL

A. Description

Trimming existing ditches shall include, but not necessarily be limited to, trimming, sloping, and shaping existing ditches within limits shown on the Plans and in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.
2. Clearing and grubbing; Section 02110.
3. Riprap ditches; Section 02291.
4. Riprap slope and channel protection; Section 02295.
5. Turf establishment; Section 02820.
6. Slid sodding; Section 02830.

C. Quality Assurance

The County Engineer will inspect all work performed under this Section to ensure compliance with the Contract Documents.

D. Submittals

None.

02270.02 MATERIALS

Not applicable.

02270.03 EXECUTION

Within the limits shown on the Plans for trimming existing ditches, clearing and grubbing shall meet the requirements of Section 02110.03. Existing ditches, parallel and contiguous to embankment slopes, shall be trimmed, sloped, and shaped in accordance with the grades and typical cross sections shown on the Plans. All other existing ditches shall be trimmed, sloped, and shaped to a uniform grade and cross section, and the side slopes shall be constant and shall not be steeper than 2:1 unless otherwise indicated. Surplus or unsuitable materials removed in completing the work shall be disposed of in

accordance with the requirements of Section 02210.01.

02270.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02270.05 BASIS OF PAYMENT

A. General

RESERVED FOR FUTURE USE

B. Trimming

RESERVED FOR FUTURE USE

SECTION 02280

SOD SHOULDERS

02280.01 GENERAL

A. Description

Constructing sod shoulders shall include, but not necessarily be limited to, the forming and compacting of earth shoulders and the placing and establishing of solid sodding in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.

2. General excavation; Section 02210.

3. Structure excavation; Section 02220.

4. Borrow excavation; Section 02240.

5. Trench excavation; Section 02250.

6. Placing salvaged topsoil; Section 02812.

7. Furnishing topsoil; Section 02813.

8. Solid sodding; Section 02830.

C. Quality Assurance

1. Materials

   a. Quality assurance requirements for earth shoulder materials shall be as specified in Section 02260.01.

   b. Quality assurance requirements for solid sodding shall be as specified in Section 02830.01.

2. Soil Laboratory and Field Density Tests

   a. The Contractor will arrange for all soil laboratory and field density testing on the Project. The Contractor will retain a Geotechnical Engineer, a Professional Engineer, registered in the State of Maryland for all soil related evaluations. The Geotechnical Engineer shall determine the number of samples to be taken and the frequency of tests required to confirm

compliance with the Specifications. The Contractor shall assist the Geotechnical Engineer in obtaining samples and shall provide a smooth surface for conducting moisture/density tests. The Contractor will not be entitled to any claim for additional compensation due to the testing requirements specified herein.

b. At the start of sod shoulders construction, the Contractor shall demonstrate to the Geotechnical Engineer, with the concurrence of the County Engineer, that the compaction density specified in Section 02260.03 can be attained by the compaction equipment and methods the Contractor intends to use. Once the method and equipment has been approved, no substitutions will be permitted without the Engineer's approval.

c. Should testing determine that the required density is not being met, or the material is outside the specified moisture range, the Contractor shall, without additional compensation reexcavate, re-work, and/or recompact the particular layer or section until the required density and moisture are attained.

d. The Contractor shall supply the County Engineer with soil tests results on a bi-weekly basis.

3. Tolerances

Generally discernible variations in the elevation of shoulders or alignment of the shoulder line from that shown on the Plans will not be permitted. The cross slope of the completed shoulder shall in no instance be less than that shown on the typical cross section nor exceed that amount by more than 20%. Variations in excess of those noted above shall be corrected to within the tolerances indicated in order to preserve a neat and uniform appearance. In order to secure uniformity and to avoid variations, the Engineer may require the Contractor to provide a shoulder template so designed as to indicate the proper pitch or slope of the shoulder surfaces for the full width. When the shoulder template is required, the finishing operations will be checked at intervals as may be necessary.

D. Submittals

1. Embankment Materials

a. Material test results shall be submitted for all embankment materials furnished from other than a licensed commercial operating supplier. The tests shall demonstrate that the material meets all the requirements specified herein.

b. Certificates of compliance shall be submitted in accordance with the "General Provisions" for embankment materials furnished from a licensed commercial operating supplier. The certificates shall state that the material meets the requirements specified.

2. Sod

Quality assurance and submittals for sod shall be as specified in Section 02830.01.

02280.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any materials for sod shoulder construction.

B. Contractor's Options

The Contractor may use suitable materials obtained from General, Structure, Borrow, Trench, and other excavations for the construction of shoulders.

C Detailed Material Requirements

Material used for earth shoulders shall meet the requirements of Sections 02260.02 and 02830.02.

02280.03 EXECUTION

A. Earth Shoulders

Earth shoulders shall be formed and compacted as soon as possible after the surfacing item is complete but in the case of concrete surfacing, not until permission has been given by the Geotechnical or County Engineer.

Any damage to the surfacing or pavement by reason of carelessness or negligence on the part of the Contractor shall be repaired to the satisfaction of the Geotechnical or County Engineer at the sole expense of the Contractor.

The entire shoulder area shall be uniformly and thoroughly compacted by rolling with compaction equipment as described in Section 02260.03.

The areas to be shaped and compacted shall include all shoulder areas constructed to the specified cross slope, except paved surfaces. The construction of the shoulders shall be in accordance with the typical cross section of improvement which is shown on the Plans or the Standard Details.

B. Sodding

After the earth shoulder has been shaped and compacted, the surface shall be solid sodded in accordance with the requirements of Section 02830.03.

02280.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02280.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE