

SECTION 02811
SALVAGED TOPSOIL

02811.01 GENERAL

A. Description

Salvaged topsoil shall include, but not necessarily be limited to, stripping or otherwise removing approved topsoil from selected areas, and transporting and depositing it in storage piles at approved locations 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. Channel or stream change excavation; Section 02230.
5. Borrow excavation; Section 02240.
6. Trench excavation, backfill and compaction; Section 02250.
7. Placing salvaged topsoil; Section 02812.

C. Quality Assurance

The County Engineer may inspect the material as it is being removed to determine that the material meets the requirements specified herein and in Section 02813.02.

D. Submittals

None.

02811.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any additional materials for salvaged topsoil other than those materials which are available within the excavation and grading limits of the project site as designated on the Plans by sections, guidelines, spot elevations, and/or contour lines, or as specified.

SALVAGED TOPSOIL

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B. Contractor's Options

RESERVED FOR FUTURE USE

C. Detailed Material Requirements

1. Lime and other soil amendments shall be as specified in Section 02820.02.
2. Materials for salvaged topsoil shall be that surface material identified as topsoil through soil surveys and examinations and/or indicated on the Plans. The amount of lime and other soil amendments, if any, to be added to salvaged topsoil will be specified.
3. Salvaged topsoil infested with any parts (seed, rhizomes, roots, etc.) of Johnsongrass Canada Thistle, or other noxious weeds will be evaluated by the County to determine the severity of infestation prior to salvaging operations and/or placement. The evaluation of the topsoil will determine how the topsoil is to be used and what control procedures are to be undertaken to prevent further spread of this weed.

02811.03 EXECUTION

A. General

Topsoil to be stockpiled shall be salvaged from the areas and to the depths designated on the Plans or by the County Engineer.

B. Stripping Topsoil

1. Before stripping or removing topsoil, the Contractor shall mow or otherwise remove all heavy grass, weeds or other vegetation over areas from which topsoil is to be salvaged. Equipment and methods of operation shall avoid lifting subsoil or other unsuitable material.
2. If soil or weather conditions are unsuitable, as determined by the County Engineer, the Contractor shall cease stockpiling operations until permission to resume stripping and stockpiling operations is obtained from the County Engineer.

C. Storing Topsoil

1. The topsoil shall be kept separate from other excavated materials and be completely removed to the required depth from any designated area before beginning regular excavation or embankment work in the area. Topsoil shall not be removed to a depth greater than directed by the County Engineer.

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2. Salvaged topsoil shall be placed on well drained land away from active streams in accordance with approved erosion control measures. Salvaged topsoil shall be placed in piles of neat conformations and temporarily seeded and mulch immediately after final shaping of the pile.

02811.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02811.05 BASIS OF PAYMENT

FUTURE U RESERVED FOR SE

SECTION 02812

PLACING SALVAGED TOPSOIL

02812.01 GENERAL

A. Description

Placing salvaged topsoil shall include, but not necessarily be limited to, the preparation of surfaces to be covered with salvaged topsoil, and the loading, hauling, placing, and spreading over these surfaces of the salvaged topsoil obtained from existing stockpiles, and the application of lime, weed control, and/or soil amendments in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.
2. Salvaged topsoil; Section 02811.
3. Turf establishment; Section 02820.

C. Quality Assurance

The County Engineer may inspect the material as it is being placed to determine that the material meets the requirements specified herein and in Section 02813.02.

D. Submittals

None.

02812.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any additional materials for placing salvaged topsoil other than those materials which are available within the excavation and grading limits of the project site as designated on the Plans by sections, guidelines, spot elevations, and/or contour lines, or as specified.

B. Contractor's Options

RESERVED FOR FUTURE USE

C. Detailed Material Requirements

1. Lime and other soil amendments shall be as specified in Section 02820.02.

2. Materials for salvaged topsoil shall be as specified in Section 02811.02.

02812.03 EXECUTION

A. General

Immediately before the start of hauling operations, all grass, weeds, brush, stumps, and other objectionable material shall be removed from the stockpile from which the topsoil is to be obtained.

B. Equipment and Methods of Operation

1. Equipment and methods of operation shall avoid the lifting of subsoil or other unsuitable material with the topsoil. If topsoil is removed from stockpiles in excess of the amount necessary to complete this item, it shall be returned to the stockpile.
2. During hauling operations, roadway surfaces shall be kept clean. Any topsoil or other material brought upon any roadway surface shall be removed promptly and thoroughly before it becomes compacted by traffic.

C. Surface Preparation

The Contractor shall completely prepare the surface of all areas to be covered with topsoil under this item and finish them to the lines indicated on the Plans and parallel to the proposed finished grade. The surfaces shall be free from rock or other foreign material which is 1-1/2-inches or greater in any dimension. Immediately before being covered with topsoil, the prepared surface shall be raked or otherwise loosened. Before placing the topsoil, all construction work in the area shall have been completed.

D. Placing and Spreading

1. Topsoil shall be placed and spread over the areas designated to a depth that, after natural settlement, the completed work shall be in accordance with the thickness, lines, grades, and elevations shown on the Plans.
2. After spreading the salvaged topsoil, all large stiff clods, hard lumps, large rocks, roots, stumps, litter, or other foreign matter shall be raked up, removed from the topsoiled area, and disposed of by the Contractor. Lime, weed control, and soil amendments shall be added as specified in Section 02820.03 or Section 02830.03. This work shall be completed in a manner that will permit seeding or planting, without additional soil preparation.
3. When topsoil is placed on slopes on which the characteristics of the subsoil are such that it will blend with the topsoil, the Contractor shall work the topsoil into the subsoil by means approved by the County Engineer to eliminate any semblance of a slip-plane between the two materials and leave a sufficient cover of topsoil to insure germination of the seed.
4. Where subsoils on slopes are of a character that will not blend with the topsoil, the Contractor shall roughen, ridge, or serrate the subsoil to provide a bond for the topsoil until the seeds can germinate and develop roots into the subsoil.

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5. At the written direction of the County Engineer, topsoil may be omitted from slopes where its use is not necessary or advantageous.
6. The Contractor shall maintain the specified depth of topsoil from the time it is placed until seeding and securing of mulch are completed.

E. Temporary Shutdown

If soil or weather conditions are unsuitable, as determined by the County Engineer, the Contractor shall cease placing topsoil until permission to resume topsoil operations is obtained from the County Engineer.

02812.04 METHOD OF MEASUREMENT

A. General

RESERVED FOR FUTURE USE

B. Average End Area

RESERVED FOR FUTURE USE

C. Struck Load

RESERVED FOR FUTURE USE

02812.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE

SECTION 02813
FURNISHED TOPSOIL

02813.01 GENERAL

A. Description

Furnished topsoil shall include, but not necessarily be limited to, preparation of surfaces to be covered with topsoil, furnishing, excavating, loading, and hauling of loamy topsoil from an approved source, placing and spreading of this topsoil over the prepared surfaces, and the application of lime and soil amendments in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Protection of the environment; Section 01500.
2. Salvaged topsoil; Section 02811.
3. Placing salvaged topsoil; Section 02812.
4. Turf establishment; Section 02820.

C. Quality Assurance

1. The County Engineer may inspect the material prior to and/or as it is being placed to determine that the material meets the requirements specified herein.
2. The Contractor shall furnish a 50 pound sample of topsoil from each intended topsoil source to the County Engineer for inspection. No topsoil shall be placed without prior approval of the material sample by the County Engineer.

D. Submittals

The Contractor shall submit a certified grading analysis to the County Engineer for each topsoil source.

02813.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any topsoil other than that which is available within the excavation and grading limits of the project site as designated on the Plans by sections, guidelines, spot elevations, and/or contours lines, or as specified.

B. Detailed Material Requirements

1. Lime and other soil amendments shall be as specified in Section 02820.02.
2. Natural Topsoil
 - a. Furnished topsoil shall consist of natural surface soil from well drained areas from which no topsoil has previously been stripped.
 - b. The area or areas from which topsoil is to be taken shall possess such uniformity of soil, depth, color, and other characteristics to offer assurance that when removed in commercial quantities that the soil shall be homogeneous in nature and meet the requirements of these Specifications. The soil shall be free from material harmful to plant growth and any parts (seed, rhizomes, roots, etc.) of Johnsongrass, Canada Thistle, or other noxious weeds.
 - c. The topsoil shall have an organic content of not less than 1.5% by weight when determined in accordance with MSMT 603. Furnished topsoil shall have a pH value not less than 6.0. Lime shall be applied and incorporated with the furnished topsoil as specified. Other soil amendments shall be applied as directed by the County Engineer.
 - d. Grading analysis shall conform to the following:

| <u>Sieve Sizes</u> <u>U.S. Standard</u> | <u>Minimum Percent Passing</u> <u>by Weight</u> |
|--|--|
| 2 inch | 100 |
| No. 4 | 90 |
| No. 10 | 80 |

Topsoil shall meet the analysis of sand, silt and clay when determined in accordance with AASHTO T 88 with the following exceptions:

| <u>Fraction Sizes</u> | <u>Percent Passing by Weight</u> |
|------------------------------|---|
| Sand (2.0-0.050 mm) | 20-75 |
| Silt (0.050-0.002 mm) | 10-60 |
| Clay (less than 0.002 mm) | 5-18 |

02813.03 EXECUTION

A. General

1. Equipment and methods of operation shall avoid lifting the subsoil or other unsuitable material with the topsoil. The Contractor shall mow or otherwise remove all heavy grass, weeds or other vegetation over areas to be stripped before lifting or removing topsoil. If topsoil is removed in excess of the amount required to complete this item, it shall be disposed of by the Contractor. Stripped topsoil containing subsoil or foreign material, including stumps, roots, brush, etc., will be rejected by the County Engineer.

2. The Contractor shall make all arrangements and assume all responsibility for consents, agreements, payments, etc. with owners of property involved in topsoil stripping operations.
3. During hauling operations, roadway surfaces shall be kept clean. Any topsoil or other material brought upon any roadway surface shall be removed promptly and thoroughly before it becomes compacted by traffic.

B. Surface Preparation

The Contractor shall prepare the surfaces of all areas to be covered with topsoil under this item and finish them to the lines indicated on the Plans, and parallel to the proposed finished grade. The surfaces shall be free from rock or other foreign material which is 1-1/2 inches or greater in any dimension. Immediately before being covered with topsoil, the prepared surface shall be raked or otherwise loosened. Before the placing of the topsoil, all construction work in the immediate area shall have been completed.

C. Placing and Spreading

1. Topsoil shall be placed and spread over the areas designated to a depth that, after natural settlement, the completed work shall be in accordance with the thickness, lines, grades and elevations shown on the Plans.
2. After spreading the topsoil, all large stiff clods, hard lumps, large rocks, roots, stumps, litter, or other foreign materials shall be raked up, removed from the topsoiled area, and disposed of by the Contractor. Spreading shall be completed in a manner that will permit seeding or planting without additional soil preparation. Lime and soil amendments shall be added as specified.
3. When topsoil is placed on slopes on which the characteristics of the subsoil are such that it will blend with the topsoil, the Contractor shall work the topsoil into the subsoil by means approved by the County Engineer to eliminate any semblance of a slip-plane between the two materials and leave a sufficient cover of topsoil to insure germination of the seed.
4. Where subsoils on slopes are of a character that will not blend with the topsoil, the Contractor shall roughen, ridge or serrate the subsoil to provide a bond for the topsoil until the seeds can germinate and develop roots into the subsoil.
5. At the written direction of the County Engineer, topsoil may be omitted from slopes where its use is not necessary or advantageous.
6. The Contractor shall maintain the specified depth of topsoil from the time it is placed until seeding and securing of mulch are completed.

D. Temporary Shutdown

If soil or weather conditions are unsuitable, as determined by the County Engineer, the Contractor shall cease placing topsoil until permission to resume topsoil operations is obtained from the County Engineer.

E. Stockpiling

If topsoil is stockpiled for future use on the project, the stockpiling shall be done as outlined in Section 02811.03.

02813.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

A. Pit Average End Area

RESERVED FOR FUTURE USE

B. Stockpiled Average End Area

RESERVED FOR FUTURE USE

C. Struck Load

RESERVED FOR FUTURE USE

02813.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE

SECTION 02820

TURF ESTABLISHMENT

02820.01 GENERAL

A. Description

Turf establishment shall include, but not necessarily be limited to, soil preparation, seeding, fertilizing, mulching, liming as required, overseeding, refertilizing, and mowing all areas disturbed by construction where designated for turf establishment in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Earthwork; Section 02200.
2. Placing salvaged topsoil; Section 02812.
3. Furnished topsoil; Section 02813.

C. Quality Assurance and Submittals

1. Fertilizer

The County Engineer may inspect and take such samples of fertilizer that the County Engineer deems necessary for testing, or may require the Contractor to furnish an affidavit from the manufacturer or a testing laboratory as to the available nutrients contained therein.

2. Mulch and Wood Cellulose Fiber

The County Engineer may visually inspect mulch.

3. Seed

Unless otherwise approved by the County Engineer permanent and temporary vegetative stabilization shall be performed in accordance with the latest edition of Standard Specifications for Soil Erosion and Sediment Control.

D. Submittals

Certificates of compliance shall be as specified in the "General Provisions" for all wood cellulose fiber and seed materials stating that the material furnished is in accordance with the requirements specified herein.

02820.02 MATERIALS

A. Materials Furnished by the County

1. The County will not furnish any materials for turf establishment.
2. The Contractor may purchase potable water from the County's potable water system for hydroseeding or turf irrigation from the County's potable water system. The Contractor shall contact the Department of Fiscal Services, Billing Section, for requirements. A backflow prevention device must be placed in accordance with the Standard Details prior to drawing County water.

B. Contractor's Options

1. Fertilizer may be furnished in either dry or liquid form unless otherwise noted.
2. Mulch may consist of straw, hay, salt hay, or wood cellulose fiber unless otherwise noted.

C. Detailed Material Requirements

1. Ground Limestone

Ground limestone shall contain not less than 80% calcium and magnesium carbonates. Dolomitic or magnesium limestone shall contain at least 10% magnesium as magnesium oxide. The limestone shall be ground to meet the following size gradation:

| <u>Sieve Sizes</u> <u>U.S. Standard</u> | <u>Percent Passing</u> <u>by Weight</u> |
|--|--|
| No. 10 | 100 |
| No. 20 | 98 |
| No.100 | 50 |

2. Fertilizer
 - a. Fertilizer shall be a standard commercial grade fertilizer meeting the requirements of all State and Federal regulations and standards of the Association of Official Agricultural Chemists. Commercial fertilizer shall provide the minimum percentage of available nutrients specified.
 - b. Fertilizer shall be furnished in bulk or new, clean, sealed, and properly labeled bags. Fertilizer failing to meet the specified analysis may be used as determined by the County Engineer providing sufficient materials are applied to comply with the specified nutrients per unit of measure without additional cost to the County.
 - c. Fertilizer analysis shall be 10-10-10 or equivalent, 0-10-10 (refertilization), and 38-0-0 (ureaform) as specified in Section 02820.03.

3. Seed

a. General

All seed shall meet the following requirements:

- 1) Each container shall be labeled in accordance with the Maryland Seed Law.
- 2) The Contractor shall furnish the County with a certification that the seed mix to be used complies with the specifications.
- 3) No seed shall be used after date of expiration.
- 4) Seedsmen (wholesale or retail) desiring to stock or furnish seed for County projects must comply with the same requirements as outlined for Contractors and must assume all service charges.

- b. Seed must comply with the Maryland Seed Law, Agricultural Article of the Annotated Code of Maryland.
- c. The percentage by weight of pure seed present shall be such agriculture seeds free from inert matter and from other seeds distinguishable by their appearance.
- d. The percentage of germination shown for agriculture seed shall be actual sprouts and not include hard seeds unless specifically permitted.
- e. Grass and agricultural seeds shall meet the following requirements:

| | Purity Not Less Than % | Weed Seed Not More Than % | Minimum % Germination Including Hard Seed | Hard Seed Not to Exceed % |
|---|---------------------------------------|--|--|--|
| Kentucky Bluegrass (Poa pratensis) (Certified Domestic Origin) Broad genetic base - North Central Origin (Example "South Dakota" and/or "Kenblue") | 90 | 0.40 | 80 | -- |
| Canada Bluegrass (Poa compressa) | 90 | 0.50 | 80 | -- |
| Redtop (Agrostis alba) | 92 | 0.75 | 80 | -- |
| Annual Ryegrass (Lolium species) | 95 | 0.25 | 85 | -- |
| Perennial Ryegrass | 98 | 0.25 | 90 | -- |

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| | | | | |
|--|------|------|----|----|
| (Lolium perenne) Boer Lovegrass | 98 | 0.50 | 80 | -- |
| (Eragrostis chloromelas) or Lehmann's Lovegrass (Eragrostis Lehmanniana) | 99 | 0.15 | 80 | -- |
| Hungarian Millett (Setaria italica) | 98.5 | 0.50 | 85 | -- |
| Creeping Red Fescue Pennlawn (Festuca rubra) (Certified Seed Only) | 98 | 0.50 | 90 | -- |
| Kentucky 31 Tall Fescue (Festuca arundinacea) (Certified Seed Only) | 98 | 0.50 | 85 | -- |
| Chewings Fescue (Festuca rubra commutata) | 99 | 0.50 | 90 | -- |
| Oats (Avena sativa) | 98.5 | 0.50 | 80 | 30 |
| Crownvetch (Coronilla varia) | 97 | 0.75 | 85 | 20 |
| White Clover (Trifolium repens) | | | | |

| | <u>Purity Not Less Than %</u> | <u>Weed Seed Not More Than %</u> | <u>Minimum % Germination Including Hard Seed</u> | <u>Hard Seed Not to Exceed %</u> |
|--|---------------------------------------|--|--|--|
| Lespedeza, Korean (Lespedeza stipulacea) | 98 | 0.50 | 85 | 20 |
| Lespedeza, Sericea (Lespedeza cuneata) | 98 | 0.50 | 85 | 2 |
| Lespedeza, Interstate (Lespedeza cuneata interstate) | 98 | 0.50 | 85 | 20 |
| Weeping Lovegrass Strain A-67 (Eragrostis curvula) | 98 | 0.50 | 80 | -- |
| Barley (Hordeum vulgare) | 98 | 0.30 | 90 | -- |
| Rye Grain, Balbo or Abruzzi (Secale cereale) | 98.50 | 0.05 | 85 | -- |
| Sudangrass | 98 | 0.30 | 80 | -- |

SPECIFICATIONS - MAY 1996

(Sorgham sundanense)

Notes: All seed is to be free of Maryland noxious weed seeds.
The above mentioned percentages are by weight.

4. Mulch

a. Mulches shall be free of clay, stones, foreign substances, plant parts of Canada Thistle and Johnsongrass, and reasonably free of other weed seeds. Mulches containing Canada Thistle and Johnsongrass shall not be sown for any purposes on any Project.

b. Straw, hay, and salt mulches shall not contain sticks larger than 1/4-inch diameter or other materials which would prevent matting down during application. No straw, hay, or salt hay mulches shall be used within 48 hours after cutting. Straw, hay, and salt hay shall be free from mold and other objectionable material and shall be in an air-dry condition suitable for placing with mulch blower equipment.

c. The following mulches may be acceptable by visual inspection provided they meet the above and following requirements:

1) Straw: Straw shall consist of thoroughly threshed wheat, rye, or oat straw.

2) Hay: Hay shall consist of native grasses or other plant material approved by the County Engineer. Hay shall be free of noxious weed seeds as specified in the Maryland Seed Law.

3) Salt Hay: Salt hay shall consist of well cured beach grasses or other approved material.

4) Wood Cellulose Fiber: Wood cellulose fiber shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state. Wood cellulose fiber shall contain a green dye that will provide easy visual inspection for uniformity of the slurry spread. The wood cellulose fiber, including dye, shall contain no germination or growth inhibiting properties. The material shall be manufactured and processed in a manner that the wood cellulose fiber will remain in uniform suspension in water under agitation and blend with seed, fertilizer, and other additives to form a homogeneous slurry. The wood cellulose fiber shall perform satisfactorily in hydraulic seeding equipment without clogging or damaging the equipment.

The manufacturer shall certify that wood cellulose fiber meets the follow requirements:

Requirements

Specification Limits

Particle Length

Approx. 3/8 inch

Particle Thickness

Approx. 3/64 inch

Net Dry Weight Content

Minimum stated on bag

| | |
|------------------------|--------------|
| pH, ASTM D778 | 4.0 to 8.5 |
| Ash Content, ASTM D586 | 1.6% maximum |
| Water Holding Capacity | 90% minimum |

The material shall be delivered in packages of uniform weight not exceeding 75 pound net weight and bear the name of the manufacturer, the net weight, and a supplemental statement of net weight content.

5) Mulch Binder

Mulch binder shall be emulsified asphalts meeting the requirements of Section 02644.02, or wood cellulose fiber meeting the requirements of Section 02820.02, Article C, Paragraph 4, Item C, 4).

6) Water

Water used in the planting or care of vegetation shall be free from oil, acids, alkalis, salts, or any substance injurious to plant life. Water from streams, lakes, ponds, or similar sources shall not be used unless the source is approved by the County Engineer.

02820.03 EXECUTION

A. Seed Mix

Charles County Seed Mix (temporary and permanent) shall be used in all areas (as applicable) unless specified otherwise.

B. Seeding Season

No seeding shall be done on frozen ground or when the temperature is 32°F or lower. If the time required for completing any of the operations necessary under this item, within the specified planting season or any authorized extensions thereof, extends beyond the contract period, then such time will be charged against the contract time; and liquidated damages will be enforced with respect to this portion of the work.

C. Schedule of Procedure

The Contractor shall begin the Contractor's work at a point or points approved by the County Engineer. When topsoil is required for areas to be seeded, all topsoiling shall be completed before seeding operations are started.

D. Soil Preparation

Soil shall be properly prepared as indicated hereafter. All areas to be seeded shall meet the finished grades shown on the plans and be free of any weed or plant growth. When ground limestone is required, it may be incorporated as part of the loosening for soil preparation. All areas shall be loosened by discing, harrowing, or other approved methods immediately prior to seeding, unless otherwise directed by the County Engineer. All clods, loose stones, and other foreign materials which are larger than 3 inches in any dimension

shall be removed. All gullies, washes, or disturbed areas that develop subsequent to final dressing shall be repaired before seeding. The seedbeds shall be as follows:

1. Areas flatter than 3:1:

The topsoil shall be loose to a depth of 3 inches.

2. Slope areas 3:1 and steeper, and non-topsoiled areas:

The subsoil or topsoil shall be loose to a depth of 1 inch.

3. Serrated cut slopes:

The subsoil shall not be loosened other than from the normal operation of the serrated cut slope construction. The top portions of the serrated cut slope areas shall be shaped, seeded, and mulched in no greater than 50-foot vertical increments before proceeding with rough grading of the lower portion of the slope.

- a. Serrated cut slope areas constructed in rippable rock and completed prior to or during the seeding season must be shaped, seeded, and mulched at the beginning of the next seeding season.
- b. Serrated cut slope areas constructed in other than rippable rock must be shaped, seeded and mulched during a seeding season.

E. Seeding

Seeding shall consist of soil preparation (Section 02820.03, Article D), and application of seed, fertilizer, and mulch. Seed application shall be by either of the following application methods as the Contractor may elect:

1. Dry Application Method

- a. Ground Limestone: Ground limestone, shall be applied, at rates as determined by soil test or no less than 50 pounds per 1000 square feet, separately before the application of any fertilizer or seed on seedbeds which have previously been prepared in accordance with Section 02820.03, Article D. Where ground limestone is required to be worked in, the seedbed shall again be properly graded and dressed for seeding. Refer to Section 02820.03, Article I., for application rates to be used on non-topsoiled areas. Limestone shall be worked into seedbeds as follows:

| <u>Seedbed Area</u> | <u>Depth of Limestone Incorporation</u> |
|--|---|
| 4 inches of topsoil | 3 inches |
| 2 inches of topsoil | 2 inches |
| Subsoil, serrated cut slopes and other non topsoiled areas 3:1 and steeper | Incorporation not required |

- b. Fertilizer: Fertilizer of the analysis 5-10-10 shall be applied to topsoiled areas at a rate of 50 pounds per 1000 square feet. If a fertilizer having an analysis other than specified is used, its rate of application shall be adjusted to provide not less than the same amount of total nitrogen, available phosphoric acid, and total potash per unit as specified above.

When fertilizing non-topsoiled areas, including serrated cut slopes, a fertilizer of the analysis 38-0-0 (ureaform) shall also be applied at a rate of 15 pounds per 1000 square feet as an additive to the 5-10-10 fertilizer.

- c. Seed Application: Apply specified Charles County Seed Mix at the rate of 2 pounds per 1000 square feet on flat areas and 1.5 pounds per square feet on slope areas immediately after fertilizing. Rake fertilizer and seed into the prepared seedbed to a depth of not more than 1/4 inch.
- d. Seedbed Compaction: After seed has been properly covered on flat areas, the seedbed shall be immediately compacted by means of an approved lawn roller, weighing 40 to 65 pounds per foot of width for clay soil (or any soil having a tendency of pack), and weighing 150 to 200 pounds per foot of width for sandy or light soils, unless an intervening precipitation causes such rolling to be detrimental to the seeded area.

2. Wet Application Method

- a. General: Apply seed and fertilizer (ground limestone, if required) by spraying the material on previously prepared seedbeds in the form of an aqueous mixture using the methods and equipment described herein. The rates of application shall be the same as those specified for the Dry Application Method.
- b. Spraying Equipment: The spraying equipment shall have a water tank equipped with a bar or liquid level gage calibrated to read in increments not larger than 50 gallons over the entire range of the tank capacity. The gage shall be mounted to be visible to the nozzle operator. The tank shall also be equipped with an agitation system capable of keeping all the solids in the mixture in complete suspension at all times until used.
- c. Ground Limestone
 - 1) Ground limestone, if required, shall be sprayed separately from mixtures of seed and fertilizer on areas flatter than 3:1. The water-limestone mixture shall contain a maximum of 600 pounds per 100 gallons. The water-limestone mixture shall be applied at a minimum rate of 1000 gallons per acre. The water-limestone mixture shall be worked into the topsoil as required under Section 02820.03, Article E, Paragraph 1, Item a. After working the ground limestone into the topsoil, the seedbed shall again be properly graded and dressed.
 - 2) Ground limestone shall not be required to be applied separately on slope areas 3:1 and steeper. The rate of application for limestone on non-topsoiled areas shall be as specified in Section 02820.03, Article I. The water-seed-fertilizer and limestone mixture shall be

applied at a minimum rate of 1000 gallons per acre in the relative proportions specified so that these combined solids do not exceed 600 pounds per 100 gallons.

d. Application

- 1) Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which ground limestone, if required, has been incorporated. Seed and/or fertilizer shall be mixed together with water in the relative proportions specified so that these combined solids do not exceed 300 pounds/100 gallons. The water-seed-fertilizer mixture shall be applied at a minimum rate of 1000 gallons/acre.
- 2) All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All seed mixtures in aqueous agitation shall be used within eight hours after mixing, except for leguminous seed which shall be used within one hour after mixing. Seeds mixtures not utilized within the time limits shall be wasted and disposed of at locations acceptable to the County Engineer.
- 3) The mixtures shall be applied by high pressure spray equipment which shall always be directed upward into the air so the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in a manner to produce erosion or runoff.
- 4) Particular care shall be exercised to insure that application is made uniformly at the prescribed rate and to guard against misses and overlaps. Proper predetermined quantities of the mixture, as specified, shall be used to cover specified sections of known area. Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or collecting containers over the area at intervals and observing the quantity of material deposited thereon.
- 5) The spray method shall not be used during periods of high winds which prohibit satisfactory spray patterns.
- 6) Seed and fertilizer applied by the spray method need not be raked into the soil.
- 7) Any spray or residual which disfigures or otherwise damages existing structures or vegetation shall be thoroughly cleaned from the damaged surface.

3. Leguminous Seeds

All leguminous seeds shall be inoculated or treated with unexpired approved cultures in the proper proportions as indicated on the package label. The inoculant shall be stored at room temperatures, out of direct sunlight, and away from heating

units. When seeding dry with mechanical seeders, the following method of mixing the inoculant with the seed shall be followed. "The culture in powder form shall be thoroughly mixed with the seed by using a very small quantity of water; just enough to dampen the seeds before the culture is powdered on." The leguminous seed shall then be mixed with the other seeds of the formula. Seeds inoculated with the powder shall be sown within 48 hours after treatment. Inoculant and seed treated with inoculant shall not be exposed to sunlight for more than one hour prior to seeding. When seed is applied by hydraulic seeders, 10 times the quantity of inoculant recommended for dry leguminous seed application shall be used. Inoculated seed shall not be held in a slurry with fertilizer for more than one hour, otherwise reinoculation will be required before applying the seed. Inoculated seed not used within the time period shall be reinoculated.

F. Mulch Application

1. Mulch materials shall be furnished, hauled, and evenly applied on the area shown on the Plans and/or as directed by the County Engineer. All mulch shall be applied within 48 hours after seeding. Mulch applied by hand shall provide a loose depth of not less than 1.5 inches nor more than 3 inches. Mulch applied by the blowing method shall provide a loose depth of not less than 1 inch nor more than 2 inches, and 95% of the mulch shall be 6 inches or more in length. Mulch applied by the above methods shall achieve a uniform distribution and depth so no more than 10% of the soil surface is exposed. Mulch applied either by hand or the blowing method shall be spread evenly over all seeded areas at the rate of 2.0 tons per acre.
2. If the mulch is to be secured with a mulch anchoring tool, the rate shall be 2.5 tons per acre. If the tracking method is used, the rate of mulch shall be 1.5 tons per acre.

G. Securing Mulch

Mulch may be secured by any of the following methods except the mulch anchoring tool method will be required for summer seeding under conditions which will permit proper anchoring of the mulch by the mulch anchoring tool method on areas 3:1 and flatter.

Where mulch has been secured with either an asphalt binder or wood cellulose fiber binder, it will not be permissible to walk on the slopes after the binder has been applied. The Contractor is warned that in the application of asphalt binder material the Contractor must take every precaution to guard against damaging or disfiguring structures or property on or adjacent to the seeded area and that the Contractor will be held responsible for any such damage resulting from the Contractor's operations. The Contractor will be required to place temporary protective covers over existing signs just before seeding and mulching. The covering shall be immediately removed after seeding and mulching operations are completed.

1. Peg and String Method

If the peg and string method is used, the mulch shall be secured by stakes or wire pins driven into the ground on 5-foot centers or less. Binder twine shall be strung between adjacent stakes in straight lines and crisscrossed diagonally over the mulch, after which the stakes shall be driven nearly flush to the ground to draw the twine down tight onto the mulch.

2. Spray Method

If the spray method is used, all mulched surfaces shall be sprayed with the selected binder material so the surface has a uniform appearance. Mulch binder may be sprayed on the mulched slope areas from either the top or the bottom of the slope. A spray nozzle of approved design must be used. The nozzle shall be operated at a distance of not less than 4 feet from the surface of the mulch. Uniform distribution of the binder material will be required. A pump or an air compressor of adequate capacity shall be used to insure the uniform distribution of binder material.

a. Asphalt Binder

Asphalt mulch binder shall be uniformly applied to the mulch at the rate of approximately 8.0 gallons per 1000 square feet, or as directed by the County Engineer. The minimum-maximum rates of application shall be 6 and 10 gallons per 1000 square feet depending on the type of mulch and the effectiveness of the binder securing it.

b. Chemical Binder

Wood cellulose fiber used as a binder shall be applied at a net dry weight of 750 pounds per acre.

The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons.

3. Mix Method

If the mix method is used, the mulch shall be blown onto the area by a mulch blower; and the binder material shall be sprayed into the mulch as it leaves the mulch blower. For rates of application, see Spray Method above.

4. Anchoring Tool Method

If the mulch anchoring tool method is used, the mulch shall be incorporated into the soil to a minimum depth of 2 inches by equipment and a method acceptable to the County Engineer.

5. Tracking Method

If the tracking method is used, the mulch shall be incorporated into the soil with a bulldozer having steel cleats with a minimum depth of 1.5 inches. The equipment used and the method of tracking shall be acceptable to the County Engineer. Upon completion of tracking, the mulch shall be further secured as described for the spray method under Section 02820.03, Article G, Paragraph 2.

H. Wood Cellulose Fiber

Wood cellulose fiber used as a mulch shall be applied at a net dry weight of 1,500 pounds per acre. The wood cellulose fiber shall be mixed with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons. This wood cellulose fiber will be permitted to be used in the following areas when approved, and as directed, by the County Engineer:

1. Narrow disturbed areas up to 8 feet wide adjacent to pavement where traffic created gusts of wind could cause problems with straw;
2. Deep or high slope areas inaccessible to straw application by a mulching machine.

I. Ground Limestone

Ground limestone shall consist of furnishing and placing limestone on non-topsoiled areas, including serrated cut slopes, in accordance with Section 02820.03, Article E, Paragraph 1, Item a., at a rate of 2 tons of ground dolomitic limestone per acre.

J. Fertilizer

Ureaform fertilizer shall be furnished and placed as an additive per Section 02820.03, Article E, Paragraph 1, Item b, and Article L, to non-topsoiled and serrated cut slope areas and other areas directed by the County Engineer. The rate of application shall be 15 pounds per 1000 square feet unless otherwise directed.

K. Overseeding

Overseeding (flat and slope areas) shall consist of applying seed and fertilizer to previously seeded and mulched areas where turf establishment has not been successful and where remulching is not required due to mulch remaining from the previous application of mulch. Work shall be performed in the areas as directed by the County Engineer in accordance with Section 02820.03, Article E, except for requirements of soil preparation and mulch.

L. Refertilizing

Refertilizing shall consist of applying 0-20-20 fertilizer and 38-0-0 (ureaform) fertilizer each at 10 pounds per 1000 square feet to non-top-soiled and serrated cut slope areas and other areas as directed by the County Engineer in accordance with these Specifications and as follows:

1. Fertilizations: 2
2. Months after Seeding: April and September

M. Mowing

1. Rural Areas

Mowing shall consist of maintaining vegetation seeded by the Contractor by means of a 5 to 7 foot rotary or sickle bar tractor mower as directed by the County Engineer. Vegetation shall not exceed 10 inches in height nor be mowed to less than 5 inches in height.

2. Urban Areas

Mowing shall consist of maintaining vegetation seeded by the Contractor by means of riding or push mowers. First mowing should not be attempted until grass is at least three (3) inches high. No more than 1/3 of the grass leaf shall be removed by the initial cutting or subsequent cuttings. Grass height shall be maintained between

2 and 4 inches unless otherwise specified.

3. Seeded areas shall be mowed and maintained by the Contractor through at least two mowings. If following two mowings the Project has not been conditionally accepted, mowing and maintenance shall continue until conditional acceptance.

N. Repair of Defective Areas

1. The responsibility for maintaining treated areas shall be as follows. Until the Project is finally accepted, the Contractor will be required to repair or replace any seeding or mulching that is defective or damaged.
2. When either the Dry or Wet Application Method is used for work done out of season, it will be required that the Contractor establish a good stand of grass of uniform color and density.

02820.04 METHOD OF MEASUREMENT

A. Seeding and Mulching

RESERVED FOR FUTURE USE

B. Limestone

RESERVED FOR FUTURE USE

C. Fertilizer

RESERVED FOR FUTURE USE

D. Overseeding

RESERVED FOR FUTURE USE

E. Refertilizing

RESERVED FOR FUTURE USE

TURF ESTABLISHMENT 02820-17

F. Mowing

RESERVED FOR FUTURE USE

02820.05 BASIS OF PAYMENT

A. General

RESERVED FOR FUTURE USE

B. Seeding and Mulching

RESERVED FOR FUTURE USE

TURF ESTABLISHMENT

02820-14

C. Limestone

RESERVED FOR FUTURE USE

D. Fertilizer

RESERVED FOR FUTURE USE

E. Overseeding

RESERVED FOR FUTURE USE

F. Refertilizing

RESERVED FOR FUTURE USE

G. Mowing

RESERVED FOR FUTURE USE

SECTION 02830

SOLID SODDING

02830.01 GENERAL

A. Description

Solid sodding shall include, but not necessarily be limited to, furnishing, hauling, and placing grass sod and fiberglass erosion stops on prepared areas in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Earthwork; Section 02200.
2. Placing salvaged topsoil; Section 02812.
3. Furnishing topsoil; Section 02813.

C. Quality Assurance and Submittals

1. Grass sod shall be Maryland certified sod complying with the Maryland Sod Law of the Annotated Code of Maryland.
2. Each load of sod must bear a Maryland State approved or certified label at the time of delivery on the job site.
3. The percentage figures in Section 02830.02, Article A, Paragraphs 1 through 3 shall comply with Maryland Sod Law tolerances.

02830.02 MATERIALS

A. Materials Furnished by the County

1. The County will not furnish any materials for solid sodding.
2. The Contractor may purchase water from the County's potable water system for solid sodding. The Contractor shall contact the Department of Fiscal Services, Meter Section, for requirements. A backflow prevention device must be placed in accordance with the Standard Details prior to drawing County water.

B. Contractor's Options

Fertilizer may be furnished in either dry or liquid form unless otherwise noted.

C. Detailed Material Requirements

1. Grass Sod

Grass sod shall be well rooted and produced in the State of Maryland. It shall, when placed, be live growing grass not less than 14-months old. It shall, when placed, have been cut and rolled (stored) not longer than 48 hours. It shall be cut in strips not less than 12-inches nor more than 18-inches wide and have 3/4 inches of soil firmly attached to the roots. The sod thickness shall not be deficient more than 1/4-inch from the required thickness at or just before placement. This 1/4-inch tolerance does not relieve the Contractor of the responsibility of cutting the sod a full 3/4-inches thick. The thickness of sod is measured by the thickness of soil firmly attached to the root system. The height of grass or thickness of thatch has no bearing on the determination of sod thickness. The sod and attached soil shall be free from noxious weeds: Common Bermudagrass, Nutsedge, Quackgrass, Garlic, Johnsongrass, Poison Ivy or Poison Oak, and Canada Thistle. Any lot of sod containing the following weeds either individually or collectively exceeding one percent of the total plant population by plant count or surface area covered shall be rejected as follows: Orchard-grass, Nimblewill, Annual Bluegrass, Crabgrass, Goosegrass and Foxtail. It shall not contain substances deleterious to growth or which might affect the survival or hardiness of the sod when transplanted.

- a. Bluegrass sod shall contain not less than 80% Kentucky Bluegrass (*Poa pratensis*) and not more than 20% Red Fescue.
- b. Tall Fescue sod shall contain not less than 80% Tall Fescue grass with no more than 20% Kentucky Bluegrass and Red Fescue.
- c. Bermudagrass sod shall contain not less than 99% Bermudagrass with not more than 1% of other grasses.

2. Fertilizer shall be as specified in Section 02820.02.

3. Ground limestone shall be as specified in Section 02820.02.

4. Fiberglass erosion stop shall be composed of lime borosilicate glass fibers cut to an average length of 2 inches to 4 inches with an average diameter of 8 to 12 microns and bonded with a phenol formaldehyde resin.

Fiberglass erosion stop shall be 1/2-inch thick.

5. Water shall be as specified in Section 02820.02.

6. Pegs shall be as specified in Section 02860.02.

7. Staples shall be as specified in Section 02860.02.

02830.03 EXECUTION**A. General**

Sod sections or strips shall be of a length as may be readily lifted without breaking, tearing or loss of soil.

Sections or strips shall be cut by approved sod cutters, hauled or carried to storage piles or the point of installation without breaking, and set in final place as indicated on the Plans. All sod shall be transplanted within 24 hours from the time it is harvested, unless it is stacked at its destination in a manner satisfactory to the County Engineer. All sod in stacks shall be kept moist and protected from exposure to the air, sun and freezing. Any sod permitted by the Contractor to dry out may be rejected whenever, in the judgment of the County Engineer, its survival after placing is rendered doubtful. No payment will be made for rejected sod.

In no event shall more than 48 hours elapse between the cutting and placement of sod.

During wet weather, sod shall be allowed to dry sufficiently to prevent tearing as a result of handling and placing. During dry weather it shall be watered before cutting and lifting to insure its vitality and prevent the dropping off of soil in handling.

B. Ground Preparation

Before placing sod upon any topsoiled surfaces, all shaping and dressing of such surfaces shall be completed. The completed areas to be sodded shall present a smooth, uniform, well tilled surface true to line and cross-section. Any raking required to accomplish this shall be done immediately before placing the sod. All areas to be sodded shall be fertilized with a commercial fertilizer of an analysis 10-10-10 and ureaform fertilizer 38-0-0 at the respective rates of 20 pounds 1000 square feet and 5 pounds 1000 square feet in accordance with Section 02820.03, Article E, Paragraph 1, Item b, and limed with ground limestone at the rate of 100 pounds 1000 square feet in accordance with Section 02820.03, Article E, Paragraph 1, Item a. The lime and fertilizer shall be worked into the top 2 inches of soil before placing sod. After it is placed, the sod shall be topdressed with ureaform fertilizer 38-0-0 at the rate of 5 pounds 1000 square feet. If a commercial fertilizer having an analysis other than the above is used, its rate of application shall be adjusted to provide not less than the same amount of total nitrogen, available phosphoric acid and total potash per unit area as specified herein.

C. Sod Placement

No sod shall be placed between the dates of June 1st and August 15th inclusive unless adequate irrigation is available to establish the sod nor any time when the temperature is below 32°F. No frozen sod shall be used. No sod shall be placed upon frozen soil.

Sod shall be lifted from trucks or storage piles and placed by approved methods with close joints and no overlapping. All cracks between blocks of sod shall be closed with small pieces of sod. All sod shall be tamped or rolled after laying to close the seams between the pieces and press the sod tight against the ground. A hand tamper shall weigh approximately 15 pounds and have a flat surface of approximately 100 square inches. A roller shall weigh 40 pounds per foot of width. Any slipping of sod is to be corrected by the Contractor without additional compensation.

D. Watering

The sod shall be watered a minimum of 3 times after placement. The sod and soil directly beneath the sod shall be kept moist, by additional waterings if necessary, until acceptance or it has become established. The first watering shall be within four hours of laying the sod.

The second and third waterings shall be within 2 weeks of the first watering when and as directed by the County Engineer. In the event the Contractor considers watering or additional watering to be required and has not been directed to do so, the Contractor shall notify the County Engineer in writing of this need. No sod will be accepted until the water requirements have been satisfied, and the sod appears in good health.

E. Sodded Slopes and Drainage Ditches

On slopes 2:1 and steeper, sod shall be laid with the long edges parallel to the contour starting at the bottom of the slope. Successive strips shall be neatly matched and all joints staggered or broken. When placing sod in drainage ditches, the length of the strip shall be laid perpendicular to the direction of the flow of the water. Where the sod may be displaced during sodding operations, the workmen, when replacing it, shall work from ladders or treaded planks to prevent further displacement.

Each strip or section of sod placed on slopes 2:1 and steeper and surface drainage V-shaped or flat bottom ditches or gutters shall be staked securely with at least 2 wooden pegs spaced not more than 2-feet apart with the flat side against the slope and driven flush with the top of sod.

F. Fiberglass Erosion Stop

Construction requirements for fiberglass erosion stop shall be in accordance with the manufacture's recommendations and as herein specified. Fiberglass erosion stops shall be installed in drainage channels under solid sodding as follows:

1. Approximately 3 feet down flow from the discharge of a feeder channel;
2. The minimum-maximum spacing between erosion stops shall be 20 to 50 feet.

G. Mowing

Mowing shall consist of maintaining areas sodded by the Contractor by means of riding or push mowers. First mowing should not be attempted until grass is at least three (3) inches high. No more than 1/3 of the grass leaf shall be removed by the initial cutting or subsequent cuttings. Grass height shall be maintained between 2 and 4 inches unless otherwise specified.

Sodded areas shall be mowed and maintained by the Contractor through at least two mowings. If following two mowings the Project has not been finally accepted, mowing and maintenance shall continue until final acceptance.

H. Repair of Defective Areas

1. The responsibility for maintaining sodded areas shall be as follows:

Until the Project is finally accepted, the Contractor will be required to repair or replace any sod that is defective or damaged. When, in the judgment of the County Engineer, such defects or damages are the result of poor workmanship or failure to meet the requirements of the Specifications, the cost of necessary repairs or replacement shall be borne by the Contractor.

02830.04 METHOD OF MEASUREMENT

A. Solid Sodding

RESERVED FOR FUTURE USE

B. Fiberglass Erosion Stop

RESERVED FOR FUTURE USE

02830.05 BASIS OF PAYMENT

A. General

RESERVED FOR FUTURE USE

B. Solid Sodding

RESERVED FOR FUTURE USE

C. Fiberglass Erosion Stop

RESERVED FOR FUTURE USE

SECTION 02840

JUTE MATTING OVER SOD

02840.01 GENERAL

A. Description

Jute matting over sod shall include, but not necessarily be limited to, furnishing, hauling, and placing solid sod and jute matting on prepared areas in accordance with the Contract Documents. The jute matting shall be placed over the sod and fastened to the sod and the soil beneath with wire staples.

B. Related Work Included Elsewhere

Solid sodding; Section 02830.

C. Quality Assurance

The County Engineer will inspect all materials prior to and/or after installation to ensure compliance with the Contract Documents.

D. Submittals

None.

02840.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any materials for jute matting over sod.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. Solid sod shall be as specified in Section 02830.02.
2. Jute matting shall be a uniform open plain weave of undyed and unbleached single jute yarn averaging 130 pounds per spindle of 14,400 yards. Rolls of matting shall also meet the following requirements: width - 48 ± 1 inch; 78 warp ends per width of matting; 41 weft ends per linear yard of matting; weight of any one shipment shall not average less than 1.20 pounds per yard.
3. Water shall be as specified in Section 02820.02.

4. Staples shall be as specified in Section 02860.02.

02840.03 EXECUTION

The methods of construction for placing sod shall be in accordance with Section 02830.03, Article A, omitting the last paragraph.

Jute matting shall be placed immediately after sodding operations have been completed in the work locations. Matting shall be rolled on in the direction of the flow of water. Where more than one width of matting is required, the strips shall overlap at least 4 inches. Ends shall overlap at least 6 inches. The upgrade end of matting shall be turned down and buried to a depth of not less than 6 inches with the soil firmly tamped against it. Overlapping shall be done with the upgrade section on top.

Matting shall be laid loosely upon the sod surface, and stretching shall be avoided. Matting shall be securely fastened with staples driven vertically into the soil and flush with the surface. Matting is to be in firm contact with the sod in its entirety. Staples shall be placed 2 feet apart along the edges and center of the matting. When more than one width of matting is required, the rows of staples other than the edges and center shall be spaced 3 feet apart in the row; and the rows shall not be more than 2 feet apart. Staples shall be placed alternately to adjacent rows. On all overlapping ends of the matting, staples shall be placed 6 inches apart.

If any staples become loosened or raised, or if any matting or sod comes loose, torn or undermined, satisfactory repairs shall be made immediately without additional compensation.

02840.04 METHOD OF MEASUREMENT

RESERVED FOR FUTURE USE

02840.05 BASIS OF PAYMENT

RESERVED FOR FUTURE USE

SECTION 02850

SOIL STABILIZATION MATTING

02850.01 GENERAL

A. Description

Soil stabilization matting shall include, but not necessarily be limited to, furnishing and placing jute or excelsior matting over seeded areas, securing with wire staples, and the installation of fiberglass erosion stops on seeded areas in accordance with the Contract Documents.

B. Related Work Included Elsewhere

Turf establishment; Section 02820.

C. Quality Assurance

The County Engineer will inspect all materials prior to and/or after installation to ensure compliance with the Contract Documents.

D. Submittals

02850.02 MATERIALS

A. Materials Furnished by the County

The County will not furnish any materials for soil stabilization matting or erosion stops.

B. Contractor's Options

Not applicable.

C. Detailed Material Requirements

1. Jute matting shall be as specified in Section 02840.02.
2. Excelsior Matting
 - a. Excelsior matting shall be machine produced from wood which has been properly cured to achieve adequately curled and barbed fibers. A maximum of 20% of the fibers may be less than 6 inches in length.
 - b. The excelsior matting shall have a uniform thickness and distribution of fibers throughout. The top and bottom of the excelsior matting shall be

covered with a biodegradable extruded plastic netting having a mesh opening 1 inch x 2 inches. The average break strength of any two strands running lengthwise shall be 5 pounds minimum. The net shall be entwined with the excelsior to aid handling and provide sufficient reinforcement against damage during handling and placement.

- c. The excelsior matting shall be smolder resistant. A chemical treatment may be applied to the matting to make it smolder resistant. The chemical treatment, if used, shall be nonleaching, nontoxic to vegetation and germination of seed, and noninjurious to human skin. Rolls of the excelsior matting shall meet the following requirements: width - 48 ± 1 inch; weight - 0.60 pounds per square yard minimum at 0% moisture; nominal roll length - 180 feet.
3. Fiberglass erosion stop shall be as specified in Section 02830.02.
4. Staples shall be as specified in Section 02860.02.
5. T-pin staples shall be as specified in Section 02860.02.
6. Materials required for seeding shall meet the requirements of Section 02820.02, except mulch binder will not be required.

02850.03 EXECUTION

A. General

When topsoil is specified for areas where matting is being placed, topsoil placement shall be completed before the soil stabilization matting operations are started.

B. Seeding

Seeding shall be performed in accordance with the provisions of Section 02820.03, except that Fall season installation of soil stabilization matting shall end on September 30, and the rolling operation shall be omitted. The seed mixture shall be the same as in the areas immediately adjacent to the area where matting is to be placed.

C. Placing and Securing

The matting shall be placed within 48 hours after seeding operations have been completed in the work areas. Matting shall be rolled on in direction of the flow of water. Where more than one width of matting is required, the strips shall overlap at least 4 inches. Ends shall overlap at least 6 inches. The upgrade end of each strip of matting shall be turned down and buried to a depth of not less than 6 inches with the soil firmly tamped against it. Overlapping shall be done with the upgrade section on top. The County Engineer may require any other edge exposed to more than normal flow of water be buried in a similar manner. Edges of matting must be similarly buried around the edges of catch basins and other structures. Disturbed areas shall be fertilized and reseeded with the specified seed mixture for the area.

Matting shall be laid smoothly upon the seeded surface, and stretching shall be avoided. Matting shall be securely fastened with staples driven vertically into the soil, flush with the

surface. Matting shall be in firm contact with the soil in its entirety. Staples shall be placed 2 feet apart along the edges and center of the matting. On all overlapping edges, staples shall be placed 18 inches apart. At all ends of the matting, staples shall be placed 6 inches apart.

If any staples become loosened or raised, or any matting becomes loose, torn or undermined, satisfactory repairs shall be made immediately without additional compensation. If seed is washed out before germination, the area shall be fertilized and reseeded without removal of the matting, and without additional compensation.

D. Fiberglass Erosion Stop

Construction requirements for fiberglass erosion stop shall be in accordance with the manufacture's recommendations. Specified fiberglass erosion stops shall be installed in drainage channels under soil stabilization matting as follows:

1. Approximately 1 yard down flow from the discharge of a feeder channel;
2. The minimum-maximum spacing between erosion stops shall be 20 and 50 feet, respectively.

E. Contractor's Responsibility

Immediately before final acceptance of the Project, it shall be the responsibility of the Contractor to remove all heaved staples, which have been in place a minimum of 6 months, from areas to be mowed, or as directed by the County Engineer.

02850.04 METHOD OF MEASUREMENT

A. Soil Stabilization Matting

RESERVED FOR FUTURE USE

B. Fiberglass Erosion Stop

RESERVED FOR FUTURE USE

02850.05 BASIS OF PAYMENT

A. Soil Stabilization Matting

RESERVED FOR FUTURE USE

B. Fiberglass Erosion Stop

RESERVED FOR FUTURE USE

SECTION 02860

FURNISH AND PLANT TREES, SHRUBS, VINES, GROUNDCOVERS, AND SEEDLING STOCK

02860.01 GENERAL

A. Description

Furnishing and planting trees, shrubs, vines, groundcovers, and seedling stock shall include, but not necessarily be limited to, all material and planting operations, plant care and replacement necessary to complete the work as specified in accordance with the Contract Documents.

B. Related Work Included Elsewhere

Turf establishment; Section 02820.

C. Quality Assurance

1. Inspection at Nursery

- a. Inspection will be made at the nursery. Prior to starting work, the Contractor shall submit in writing an itemized list of sources of all plant items and shall give the County Engineer all necessary assistance when inspections are made.
- b. All shipments of plant material shall be properly inspected at the nursery by the authorized Federal and State authorities as may be required by the Federal Horticultural Board, Washington, D.C., for the necessary transporting of the same from the state or district where the nursery is situated to the project.
- c. Plant materials, represented by each shipment, invoice, or stock order, shall be declared and certified free from disease of any kind. All necessary inspection certificates to the effect which are required by law for the necessary interstate or interdistrict transportation shall accompany each shipment, invoice, or stock order.
- d. Certain plant materials may be inspected prior to digging by a representative of the County. Certain items selected may be marked with a seal furnished by the County. Plant material grown in fields or blocks which show evidence of containing any parts (seed, rhizomes, roots, etc.) of Johnsongrass or Canada Thistle will not be accepted. An approval of material on such inspection shall not be construed as an acceptance of it. The plant materials will again be inspected upon arrival on the project site.

2. Inspection at Project Site

**FURNISH AND PLANT TREES, SHRUBS, VINES,
GROUNDCOVERS, AND SEEDLING STOCK**

02860-2

- a. Inspection will be made by the County Engineer at the project site upon the Contractor's receipt of nursery stock.
 - b. No shipment of plant material shall be planted by the Contractor until inspected and accepted by the County Engineer. Plant materials arriving with broken seals; broken or loose balls; insufficient protection of roots or top; shriveled, dry, or insufficiently developed roots; or which are weak, thin, damaged, defective, or which do not comply with the Contract Documents will be rejected.
 - c. All rejected material shall be immediately removed from the Project Site by the Contractor or the Contractor's agent. The County will not assume any responsibility for such rejected material.
3. Peat Moss
- Certified delivery slips designating the size and quantity of the bales shall be furnished the County Engineer.
4. Peat Humus
- Samples of peat humus to be analyzed may be taken by the County Engineer. The approval shall be based on this test, but the County Engineer reserves the right to reject on or after delivery any material that does not meet the requirements specified herein.

02860.02 MATERIALS

A. Materials Furnished by the County

1. The County will not furnish any trees, shrubs, vines, groundcovers, seedling, stock, or other materials.
2. The Contractor may purchase water from the County's potable water system for planting trees, shrubs, vines, groundcovers, and seedling stock. The Contractor shall contact the Department of Fiscal Services, Meter Section, for requirements. A backflow prevention device must be placed in accordance with the Standard Details prior to drawing County water.

B. Contractor's Options

Mulch may consist of either hardwood or softwood chips.

C. Detailed Material Requirements

1. Topsoil shall be as specified in Section 02813.02.
2. Ground limestone shall be as specified in Section 02820.02.
3. Fertilizer shall be as specified in Section 02820.02

4. Seed shall be as specified in Section 02820.02.
5. Mulch
 - a. Wood Chips

Wood chips shall be either hardwood or softwood chips, produced by a chipping machine to a size acceptable to the County Engineer. Chips shall not have been subjected to any conditions that would shorten their life or cause them to lose any of their value as mulch. Wood chips shall be free from leaves, twigs, wood shavings, sawdust, toxic substances, and any foreign materials.
 - b. Licorice Root

Licorice root shall be the byproduct of the Licorice Extraction Process. It shall be fibrous material free from foreign and toxic substances.
 - c. Tan Bark or Root

Tan bark or tan root shall be the byproduct of the tanning process. It shall be fibrous material free from foreign and toxic substances.
6. Plant Material
 - a. Plants
 - 1) All plants shall be first class representatives of the normal species or varieties unless otherwise specified.
 - 2) All plants shall be nursery grown, unless otherwise specifically permitted; i.e., collected or plantation grown, and shall have been grown within plant hardiness zones five, six, seven, or the Maryland and Virginia portion of zone eight as recorded in the current edition of "Plant Hardiness Zone Map," prepared by the U. S. National Arboretum, Agricultural Research Service, U. S. Department of Agriculture, in cooperation with the American Horticultural Society.
 - 3) All plant materials shall have normal, well developed branches and a vigorous root system. They shall be healthy vigorous plants free from defects, decay, disfigured roots, sunscald injuries, abrasions of the bark, plant diseases, insect pest eggs, bores, and all forms of infestations or objectionable disfigurements.
 - 4) Shade and flowering trees are to be symmetrically balanced according to the normal habit of growth. Shade trees of standard variety shall have a single leader and shall be branched approximately 6 feet from the ground. Evergreens are to be full foliage, specimens of mature growth. Deciduous shrubs shall be well furnished with branches and have ample, well balanced root systems capable of sustaining vigorous growth.

b. Plant Names

The current edition of "Standardized Plant Names," adopted by the American Joint Committee on Horticultural Nomenclature, shall be the authority for all plant names.

c. Sizing

All plant material furnished shall meet the sizing and grading standards of the current edition of "American Standard for Nursery Stock," as approved by the American Standards Association, Inc., unless otherwise specified. Oversized and exceptionally heavy plants are acceptable if the size of the ball is proportionally increased to the satisfaction of the County Engineer. Plant materials that are weak or have been cut back from larger grades to meet certain specified requirements will be rejected.

d. Plant Digging

- 1) All plants shall be freshly dug at the time of delivery in accordance with the digging specifications in the current edition of "American Standard for Nursery Stock," unless otherwise specified.
- 2) During the spring planting season, all bare root deciduous plants shall be dug and delivered to the site of the project prior to the plant material coming into leaf.
- 3) All plants in leaf, including evergreens, shall be sprayed with an antidesiccant, approved by the County Engineer, before delivery and preferably before digging. All shipments shall be accompanied by an invoice, furnished to the County Engineer giving a detailed description of the plant materials, the date of shipment, a certification that all plants in leaf, including all evergreens, have been sprayed with an antidesiccant, and other pertinent information.
- 4) Representative samples of every shipment of plant materials shall be labeled as to genus, species, and specified size.
- 5) All plant material shall be handled and packed in an approved manner, having regard to climatic conditions and the time of transit or to delivery. All precautions that are good trade practice shall be taken to insure the arrival of plants at the Project Site in good condition for successful growth.

e. Substitute Plants

- 1) No substitutions shall be made without written permission of the County Engineer.
- 2) In cases where plant materials are not available at the time of planting, the Contractor shall submit, in writing, evidence from a minimum of three competent sources that the plants are unavailable.

If, in the opinion of the County Engineer, there are existing plant items in the Contract similar in size and type which will perform the function intended, these similar plant items shall be used for plant substitution. If existing plant items are not similar and the County Engineer and Contractor can mutually agree on a suitable substitution, the County Engineer will allow the Contractor to make this substitution.

7. Miscellaneous Items
 - a. Water shall be as specified in Section 02820.02
 - b. Stakes for bracing and supporting trees shall be rough-sawn, straight-grain oak or other wood approved by the County Engineer, reasonably free from knotholes, bark, wane, warp, and splits. Stakes for major trees and evergreen trees shall be 2-inch x 2-inch by 10 feet long. Stakes for minor trees and evergreen trees shall be 2-inch x 2-inch by 5 to 8 feet long. All measurements shall be nominal.
 - c. Rubber shall be 5/8-inch or 3/4-inch corded rubber hose or equal.
 - d. Wire shall be Nos. 12 and 14 gage new annealed galvanized wire.
 - e. Wrapping material for trees shall be clean new burlap 6 to 7 ounces per square yard in strips 4 to 6 inches wide.
 - f. Twine used for tying wrapping on trees shall be jute twine not less than two-ply for trees 3 inches or less in caliper and three-ply for trees over 3 inches in caliper.
 - g. Antidesiccant shall be an approved emulsion which will provide a film over plant surfaces permeable enough to permit transpiration. Antidesiccant shall be used only after approval by the County Engineer.
 - h. Deadmen shall be sound 8 inch minimum diameter oak or locust logs 4 feet long.
 - i. Turnbuckles shall be galvanized or cadmium plated with 4 1/2-inch openings and 5/16-inch threaded ends with screw eyes.
 - j. Outline stakes for 12 to 18 inch shrub areas and seedling areas shall be 1-inch x 2-inch sound wood 4 foot long. They shall have the words MOW LIMIT stenciled in orange paint vertically on one side in 1 1/2-inch letters beginning within 2 inches from the top of the stake.
 - k. Insecticide shall be a chemical to provide protection against insect pests, and shall be used only after approval of the County Engineer.
 - l. Herbicide shall be a chemical to eliminate and prevent regrowth of undesirable vegetation and shall be used only after approval by the County Engineer.

- m. Red dye shall be oil soluble from a commercial source.
- n. Manure shall be dehydrated cow manure.
- o. Pegs shall be wooden wedges 1/2-inch x 1-inch x 6-inch to 1/2-inch x 1-inch x 12-inch.
- p. Staples shall be made from No. 11 or heavier steel wire bent to form a U. The staples shall average 1 to 1-1/2 inches wide. The staple shall be at least 6 inches long from top to bottom after bending.
- q. "T"-pin staples shall be made of No. 8 wire with an 8-inch leg, 4" head and a 1 inch secondary leg.
- r. Wood cellulose fiber shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state. Wood cellulose fiber shall contain a green dye that will provide easy visual inspection for uniformity of the spread slurry. The wood cellulose fiber, including dye, shall contain no germination or growth inhibiting properties. The material shall be manufactured and processed so that the wood cellulose fiber will remain in uniform suspension in water under agitation and will blend with seed, fertilizer, and other additives to form a homogeneous slurry. The wood cellulose fiber shall perform satisfactorily in hydraulic seeding equipment without clogging or damaging the system.

The manufacturer shall certify that the wood cellulose fiber meets the following requirements:

| | | |
|-------------------------|---|-------------------------|
| Particle length | - | Approximately 3/8 inch |
| Particle Thickness | - | Approximately 1/32 inch |
| Net Dry Weight Content | - | Minimum stated on bag |
| pH, ASTM D 778 | - | 4.0 to 8.5 |
| Ash Content, ASTM D 586 | - | 1.6% maximum |
| Water Holding Capacity | - | 90% minimum |

The material shall be delivered in packages of uniform weight not exceeding 75 pounds net weight. The packages shall bear the name of the manufacturer, the net weight and a supplemental statement of the contents.

- s. Peat moss shall be sphagnum peat moss free from woody substances. Bales shall measure not less than 5.5 cubic feet per bale compressed.
- t. Peat humus shall be from fresh water sites, obtained from sedge peat and reed peat deposits in which the organic matter consists of incompletely decomposed plant residues and a negligible amount of woody matter. Peat humus shall be shredded to a fineness subject to approval by the County Engineer. Peat humus shall have a minimum organic content of 70% by weight when tested by the method in Federal Specification Q-P-166. Inorganic material shall consist only of sand, silt, and clay. Peat humus shall not contain roots, gravel, debris, or toxic compounds. Peat humus with

a pH value less than 4.5 shall have lime added as directed by the County Engineer. The County Engineer will designate where the peat humus shall be stored on the job.

- u. Tree anchors shall be earth anchors of a type commonly used for anchoring large trees.
- v. Wire rope shall be 1/4-inch zinc-coated steel wire strand as commonly used for guying large trees.
- w. Cable clamps shall be galvanized or cadmium plated.

02860.03 EXECUTION

A. Planting Schedule

Plant material shall be planted only during the following periods:

| | | |
|--------------------|---|---------------------------------|
| Deciduous Material | - | October 15 to April 30 |
| Evergreen Material | - | Spring - March 15 to May 15 |
| | - | Fall - August 15 to November 15 |
| Seedling Stock | - | March 5 to April 15 |

The above periods may be extended or reduced according to weather and soil conditions at the time, at the discretion of the County Engineer. No bare root plants shall be planted from December 15 to March 1 or during periods of freezing temperatures. Preparations for planting may begin prior to the specified seasons, provided the staking of plant locations has been approved by the County Engineer as specified herein.

B. Plant Protection and Storage

1. The Contractor shall provide adequate facilities for the protection and temporary storage of all plant material used on the project. Immediately following delivery and inspection at the project site, all plants with exposed roots shall be "heeled-in" in moist soil in a manner satisfactory to the County Engineer. All plants "heeled-in" shall be properly maintained by the Contractor until planted.
2. The balls of balled and burlapped (B & B) plants shall, if not immediately planted after delivery and inspection, be protected by covering in a manner appropriate to the conditions. The Contractor shall in loading, unloading, or handling plants exercise utmost care to prevent injuries to the branches or roots of the plants. The solidity of the balls of B & B plants shall be carefully preserved. Plants with exposed roots which are being transported to and from "heel-in," distributed in planting beds, or awaiting planting after distribution shall have the roots protected from drying by means of wet canvas, burlap, straw, or puddling if necessary. All seedlings shall be carried in a pail or bucket filled with sufficient mud to puddle the roots until planting. The means employed shall be satisfactory to the County Engineer and depend on weather conditions and length of time the roots must remain out of the ground.

C. Unsuitable Subsurface Conditions

When utility lines are encountered or other subsurface conditions in plant pits are unsuitable for the particular varieties of plants to be planted, the County Engineer will direct the plants be relocated to satisfactory locations, or will direct the Contractor to install subsurface drainage.

When the County Engineer directs that any plant be relocated or drained, the Contractor shall perform the work as directed and specified in Section 02860.03, Articles D and E.

D. Subsurface Drainage

When subdrainage in pits or trenches is required, as determined by the County Engineer, the Contractor shall install the drainage as specified in Section 02510.03.

E. Backfilling and Seeding Abandoned Planting Pits

When the County Engineer directs any plant pit be abandoned after it is partially or fully excavated, due to conditions not reasonably determinable prior to excavation, the Contractor shall backfill the pit with the excavated soil compacted in 8-inch deep layers and finished by respreading the stripped topsoil to compacted finished grade. Unsuitable material shall be removed from the property. The disturbed area shall be prepared and seeded according to Section 02820.03.

F. Preparations for Planting

The Contractor shall perform all laying out, excavating, planting, soil mixing, and backfill operations in accordance with the following:

1. Layout and Starting Work

The Contractor, when laying out and starting work, shall provide the stakes and stake-out the locations of all plant pits and outlines of all planting areas and beds as shown and detailed on the Plans. No excavation or cultivation shall begin until the locations and outlines have been approved by the County Engineer. Outline stakes for 12 to 18-inch shrub areas and seedling stock areas shall be spaced approximately 30 feet apart, or as directed by the County Engineer. They shall be driven approximately 1 foot into the ground and remain a permanent means of outline identification through the life of the Contract.

All plants shall be planted in individual pits.

2. Planting Beds

Planting beds are cultivated, edged, reared, and finished areas within which individual pits shall be excavated for each plant.

For planting beds located on steep slopes, as determined by the County Engineer, all existing grass and stabilizing growth between the pits shall be cut to a height of 2 inches before performing mulching operations.

Prior to excavating plant pits in planting beds, except on steep slopes as noted

above, the entire surface of the beds shall be prepared to a depth of 6 inches by the use of a suitable tillage machine. All grass, sod, weeds, and other growth shall be thoroughly broken up, turned, and covered with soil. Or, when directed, all sod, weeds, roots, and other objectionable material shall be removed and immediately disposed of by the Contractor.

No topsoil shall be removed from planting beds.

3. Excavation for Planting

The Contractor shall excavate all plant pits to the following diameters, depths, and to such additional depths as may be required to install 6 inches of compacted planting soil mix under the balls or root systems.

a. Deciduous Trees

5 to 6-inch caliper, pit diameter 30 inches greater than ball, minimum depth 36 inches

2 1/2 to 5-inch caliper, pit diameter 24 inches greater than ball, minimum depth 30 inches

5 feet high, 2 1/2-inch caliper, pit diameter 18 inches greater than ball, minimum depth 24 inches

less than 5 feet high, pit diameter 30 inches, minimum depth 20 inches

b. Evergreen Trees

more than 5 feet high, pit diameter 18 inches greater than ball, minimum depth 24 inches

less than 5 feet high, pit diameter 18 inches greater than ball, minimum depth 20 inches

12 to 18 inches container grown, pit diameter 18 inches, minimum depth 18 inches

c. Shrubs

12 to 18 inches high and potted vines, pit diameter 12 inches, minimum depth 10 inches

18 to 24 inches high, pit diameter 18 inches, minimum depth 18 inches

2 to 4 feet high, pit diameter 24 inches, minimum depth 16 inches

4 to 6 feet high, pit diameter 30 inches, minimum depth 20 inches

d. Tree Whips

5 to 6 feet high bare root , pit diameter 18 inches, minimum depth 18 inches

5 to 6 feet high balled and burlapped, pit diameter 30 inches, minimum depth 20 inches

- e. Seedlings (1 to 0 stock)

6 to 12 inches high, pit diameter 8 inches, minimum depth 10 inches.

A tolerance of minus 1 inch will be allowed for the above dimensions.

All excavated material, except material excavated for 12 to 18-inch shrubs and that which is specifically allowed in Section 02860.03 Article G, Paragraph 1, shall be removed before backfilling with the specified planting soil mixtures.

Plant pits located within the recover area, which is the relatively flat area a vehicle could travel without an abrupt change of direction, shall be backfilled with the specified planting soil mixture the same day they are excavated. All other pits shall be backfilled within 14 days of excavation.

4. Planting Soil Mixtures

Planting soil mixtures, hereinafter referred to as soil mixes, shall consist of the following materials:

- a. Soil mix for all plants except ericaceous material and seedling stock: 200 pounds dehydrated cow manure and ten 5.5 cubic foot bales of peat moss or 4.0 cubic yards of peat humus to 12 cubic yards of furnished topsoil.
- b. Soil mix for ericaceous material: ten 5.5 cubic foot bales of peat moss or 4.0 cubic yards of peat humus to 10 cubic yards of furnished topsoil to which no lime has been added.
- c. Soil mix for seeding stock: 4 ounces of dehydrated cow manure added to the excavated soil from each seedling planting pit immediately prior to installing the seedling plants.

Only the foregoing soil mixtures shall be used as backfill in plant pits both under and around the plant roots. No backfill shall be placed in any pits until the excavated material has been removed and the pit has been inspected and approved by the County Engineer.

No soil mix shall be mixed, worked or placed when it is in a muddy or frozen condition.

G. Planting

The Contractor will be required to perform all planting, staking, wiring, wrapping, pruning, mulching, and watering in accordance with the following:

1. General

No plants shall be planted until they have been inspected and approved as specified under Section 02860.02.

All seals and tags shall be removed after delivery when directed by the County Engineer.

Before installing plants, sufficient soil mix shall be placed and tamped in the bottom of the pits to set the plants at the proper height when fully settled after watering. The depth of this layer shall not be less than 6 inches.

Balled and burlapped plants and potted plants, from which the pots have been carefully removed, shall be set vertically thereon; the soil mix shall then be filled in around the plant balls to one-half the depth of the balls, tamped and thoroughly watered. The top of the burlap around the balls shall be loosened before or after this watering and spread out away from the plants, or if too bulky, cut away and removed. The remainder of the pit shall then be filled with the soil mix, tamped and again watered, all within the same day of planting.

The roots of bare root plants shall be spread carefully in natural positions; the soil mix shall be worked around the roots, using a method acceptable to the County Engineer, thoroughly tamped into place and thoroughly watered, all within the same day of planting.

Every care shall be taken during the backfilling, tamping, and watering to avoid injuring the roots and to eliminate air pockets. Any roots which are bruised or broken before or during planting shall immediately be pruned with a clean cut to sound tissue.

Watering shall mean full and thorough saturation of all backfill in the pits. Water shall be applied only by open end hoses at low pressure. In no case shall hoses from tank trucks be laid across ramps, roadways, or other pavements. When planted, watered, and fully settled, the plants shall be vertical and at the depth at which they were grown in the nursery.

Upon completion of planting, the outline of the planting beds shall be neatly edged, except on lower edge of planting beds on slopes where a 3-inch deep shoulder of planting soil mix or furnished topsoil shall be placed. All grass, weeds, roots and other objectionable material shall be promptly removed. All planting beds shall be free of weeds or grass except those beds on steep slopes, or where so directed by the County Engineer, which shall have existing growth cut to a height of 2 inches between pits.

Individual plant pits shall be furnished with a shoulder of soil placed outside the rim of the pits to form a saucer over the entire area of the pits. In shrub beds, the soil shoulder around individual shrubs or trees may consist of excavated soil. Trees on flat areas outside of shrub beds must be shouldered with soil mix or furnished topsoil. Trees on slopes outside of shrub beds may be shouldered with excavated soil with a minimum of 2 inches of topsoil placed over the excavated soil. On all slopes the soil shall be formed into an adequately compacted dam or shoulder on

the downhill side to catch and hold water and avoid erosion. Any excess excavated material from seedling planting pits shall be used to form a saucer for water retention for seedling stock. All slope shoulders, dams, slopes, and other disturbed or damaged areas outside of plant beds shall be seeded.

2. Mulching

All plant beds and pits shall be mulched. The mulch shall be spread to a minimum 2 inches and maximum 3 inches thickness over the entire area of the pits and plant beds. Prior to the application of wood chips, ureaform fertilizer shall be applied at the rate of 10 pounds per 1000 square feet and evenly spread over the area specified to be mulched. The mulch shall be raked to an even surface to the limits specified on the Plans or as directed by the County Engineer. All mulch shall be applied within four days after planting, except seedling stock which shall be mulched the same day the seedlings are planted. On slopes where the existing growth is to remain between plant pits, the growth is to be cut prior to applying the mulch as specified under Section 02860.03, Article F, Paragraph 1, and Section 02860.03, Article G, Paragraph 1.

3. Staking

All deciduous trees over 5 feet in height and all evergreen trees over 4 feet in height shall be staked with tree stakes. All stakes shall be installed as detailed within 24 hours of the day the trees are planted. Stakes shall be neat and secure and shall evenly support the trees to true vertical line.

Major trees over 4-inch caliper shall be anchored with three guys attached to deadmen or tree anchors.

Major trees 3 to 4-inch caliper shall be staked with three 10-foot stakes.

Major trees less than 3-inch caliper shall be staked with two 8-foot stakes.

Evergreen trees 4 to 10 feet in height, and all minor deciduous trees more than 6 feet in height, shall be staked with two 5 to 8-foot stakes as required and detailed.

Evergreen trees over 10 feet in height shall be staked with three 10-foot stakes.

In driving stakes, the Contractor shall avoid damage to the tree branches, particularly evergreens and low branched minor trees. All stakes shall be driven just outside the ball to solid bearing below the pit bottom.

Wires shall be covered with hose where in contact with trunk and branches, wrapped two full turns around the stakes, and secured in a notch so the tree is held firm and vertical. Tops of stakes shall be neatly trimmed to the proper height.

4. Pruning

All trees, shrubs, and seedlings shall be pruned after inspection on the site with care being taken to preserve the natural appearance of the plant. Broken or badly bruised branches shall be removed with a clean cut. The pruning shall be done by

skilled men in accordance with acceptable horticultural practice; appropriate to the type of seedling, shrub, or tree; and to the special requirements of the individual shrub or tree. Major trees shall be pruned after inspection on the site and before planting.

5. Wrapping

All major trees over 1 1/2-inch caliper shall be wrapped with wrapping material, overlapping 1 1/2 inches, wound from the ground line to the lowest main branches.

The wrapping shall be tied at places including the bottom, middle and top with not more than 2-foot intervals between ties. The wrapping shall be done before staking but not before the condition of the tree trunk has been inspected and tree approved by the County Engineer. Wrapping material shall be maintained in place until final acceptance of the Project. Immediately before wrapping is installed, the trunks shall be thoroughly wetted with an approved insecticide for borer control, applied with a brush and daubed into all cracks and crevices in the bark.

6. Cleanup

During the course of planting, excess and waste materials shall be continuously and promptly removed, the turf areas kept clean, and all reasonable precautions taken to avoid damage to existing structures, plants, and grass. When planting in an area has been completed, the area shall be thoroughly cleaned. All debris, rubbish, subsoil, and waste materials shall be cleaned up and removed. Existing turf areas which have been injured shall be regraded and seeded or sodded, and the entire area when completed shall be neat and clean.

H. Care and Replacement During Construction

The Contractor shall perform all care and replacement operations in accordance with the following:

1. General

The care and replacement of planting shall begin immediately after each plant is satisfactorily planted as specified under Section 02860.03, Article G, and shall continue during the entire life of the Contract. During such time, the Contractor shall do all work necessary to establish and keep the plants in a live, healthy condition.

2. Watering

The Contractor shall water all plant pits with the following minimum quantities of water for each watering:

| | |
|------------------------|---------------------|
| Major Trees | 25 gallons per pit |
| Minor Trees | 15 gallons per pit |
| Evergreen Trees | 20 gallons per pit |
| Shrubs over 18 inches | 3.5 gallons per pit |
| Shrubs 12 to 18 inches | 1 gallon per pit |
| Tree Whips | 3 gallons per pit |

Seedlings

1 gallon per pit

Prior to beginning watering, the Contractor shall notify the County Engineer in writing 48 hours in advance of the day the watering must begin; and unless directed by the County Engineer, the Contractor shall continue to water daily where and as directed until all plant pits on the Contract have been watered with the minimum specified quantities for each watering. Each watering shall be completed within 10 working days of the day watering is designated to begin.

Watering shall be performed every 14 calendar days following planting. Watering will not be required at the end of a 14 calendar day period if 1-inch or more of rainfall as measured by the National Weather Service has occurred in the area during the preceding 14 calendar days since the last watering.

3. Weeding

All plants, plant saucers, and plant beds, including those on steep slopes, shall be weeded of all weeds, including grasses, approximately three times during the life of the Contract when and as directed by the County Engineer. Each weeding shall be completed within 15 working days of the day weeding is designated to begin. The Contractor may request in writing the use of herbicides for the control of weeds and grasses. The Contractor shall prune and spray plants, repair or replace stakes and wires, reshape plant saucers, and repair washouts when and as directed by the County Engineer.

4. Defective Plant Removal

All dead or unhealthy plants shall be promptly removed. If this occurs during a planting season, these plants shall be replaced during that planting season. If between planting seasons, they shall be replaced during the first 60 days of the next proper planting season. Plants that have sizeable die-back beyond the normal pruning limit shall also be replaced.

If and when plant replacements are made, mulch shall be replaced to its original specified depth at no additional cost to the County. Time is an essential element in the establishment of plant materials, and it is important that care and replacement operations be vigorously prosecuted until completion, as failure to complete this work within the designated time limits can result in unsatisfactory plant establishment and future performance.

02860.04 METHOD OF MEASUREMENT

A. Furnishing and Planting Trees, Shrubs, Vines, Groundcovers, and Seedling Stock

RESERVED FOR FUTURE USE

B. Mulch

RESERVED FOR FUTURE USE

C. Water

RESERVED FOR FUTURE USE

D. Abandoned Planting Pits

RESERVED FOR FUTURE USE

02860.05 BASIS OF PAYMENT

A. General

RESERVED FOR FUTURE USE

B. Furnishing and Planting Trees, Shrubs, Vines, Groundcovers, and Seedling Stock

RESERVED FOR FUTURE USE

C. Mulch

RESERVED FOR FUTURE USE

D. Watering

RESERVED FOR FUTURE USE

E. Abandoned Planting Pits

RESERVED FOR FUTURE USE