

# CATEGORY 700 LANDSCAPING

## SECTION 701 - SALVAGING TOPSOIL

**701.01 DESCRIPTION.** This work shall consist of removing approved topsoil from selected areas specified in the Contract Documents or as directed by the Engineer, and transporting and stockpiling the topsoil in storage piles at locations acceptable to the Engineer.

### **701.02 MATERIALS.**

Salvaged Topsoil

920.01.01

### **701.03 CONSTRUCTION.**

**701.03.01 Topsoil Evaluation.** Topsoil infested with any parts (seed, rhizomes, roots, etc.) of Johnsongrass, Canada Thistle or Phragmites will be evaluated by the Administration prior to the salvaging operations to determine the severity of infestation. The evaluation of the topsoil will determine how the topsoil is to be used and what needs to be undertaken to prevent further spread of these noxious weeds.

**701.03.02 Topsoil Removal.** Prior to removing topsoil, the Contractor shall mow or remove all vegetation over the areas from which topsoil is to be salvaged. Topsoil shall be removed to a depth as directed by the Engineer to avoid lifting subsoil or other unsuitable material.

**701.03.03 Topsoil Storage.** Topsoil shall be kept separate from other excavated materials and shall be placed in piles of neat conformations on well drained land, away from live streams, and shall conform to Section 308. The piles shall be seeded with temporary seed immediately after final shaping of the pile. Temporary seed shall conform to Section 704.

**701.03.04 Excess Topsoil.** Excess topsoil shall become the property of the Administration and any removal will require written approval from the Engineer.

**701.04 MEASUREMENT AND PAYMENT.** Salvaging Topsoil will not be measured but the cost will be incidental to the Contract unit price per cubic yard for Class 1 Excavation.

Temporary seeding and other sediment control measures as directed by the Engineer will be paid for under the pertinent items as specified in the Contract Documents.

## **SECTION 702 - PLACING SALVAGED TOPSOIL**

**702.01 DESCRIPTION.** This work shall consist of the preparation of surfaces, loading, hauling, placing and spreading of salvaged topsoil obtained from existing stockpiles as specified in the Contract Documents or as directed by the Engineer.

### **702.02 MATERIALS.**

Salvaged Topsoil	920.01.01
Agricultural Limestone	920.02
Miscellaneous	920.08

### **702.03 CONSTRUCTION.**

**702.03.01 Topsoil Evaluation.** The Administration will reevaluate salvaged topsoil infested with any parts (seed, rhizomes, roots, etc.) of Johnson-grass, Canada Thistle or Phragmites prior to placing, to establish a means to prevent spread of these noxious weeds.

**702.03.02 Surface Preparation.** The Contractor shall completely prepare and finish the surface of all areas to be covered with topsoil as specified in the Contract Documents. Immediately prior to being covered with topsoil, the prepared surface shall be in a loose condition and be free of loose stones or other foreign material 3 in. (75 mm) or greater. When topsoil is to be placed on slopes on which the subsoil blends with the topsoil, the Contractor shall work the topsoil into the subsoil by means acceptable to the Engineer. Where subsoils on slopes are of such character that

they will not blend with the topsoil, the Contractor shall roughen, ridge or serrate the slopes so as to provide a bond for the topsoil. At the direction of the Engineer, topsoil may be omitted from slopes where its use is not feasible.

**702.03.03 Loading and Hauling.** Prior to the start of hauling operations, all grass, weeds, brush, stumps and other objectionable material shall be removed from the surface of stockpiles. The Contractor shall avoid removal of subsoil or other unsuitable material with the topsoil.

**702.03.04 Placing and Spreading.** Topsoil shall be placed, spread, and maintained over the areas designated to such a depth, that after settlement, the completed work shall be in conformance with the thickness, lines, grades and elevations specified in the Contract Documents. Loose stones and other foreign material larger than 3 in. (75 mm) shall be removed and disposed of by the Contractor. Slopes 4:1 to 2:1 shall be tracked with cleated track type equipment operating perpendicular to the slope.

Limestone and soil amendments shall be added as specified in the Contract Documents and 705.03.01(d) or 705.03.02(d).

**702.03.05 Suspension of Work.** If the soil or weather conditions are unsuitable, the Contractor shall cease topsoil operations until directed by the Engineer to resume.

**702.04 MEASUREMENT AND PAYMENT.** The payment will be full compensation for the preparation of surfaces, loading, hauling, placing, spreading, limestone and soil amendments, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

**702.04.01** Placing Salvaged Topsoil will be measured and paid for at the Contract unit price per square yard for the depth specified.

**702.04.02** Placing Salvaged Topsoil for Grading Adjustment will be measured and paid for at the Contract unit price specified in the Contract Documents.

## SECTION 703 - PLACING FURNISHED TOPSOIL

**703.01 DESCRIPTION.** This work shall consist of the preparation of surfaces, excavating, loading, hauling, placing and spreading of topsoil, as specified in the Contract Documents or as directed by the Engineer.

### 703.02 MATERIALS.

Furnished Topsoil	920.01.02
Agricultural Limestone	920.02
Miscellaneous Items	920.08

**703.03 CONSTRUCTION.** Refer to 702.03 and the following.

- (a) **Contractor Responsibility.** The Contractor shall make all arrangements and assume all responsibility for consents, agreements and payments with owners of property involved in topsoil operations.
- (b) **Administration Soil Test Reports.** Limestone and soil amendments shall be added as specified in Administration Soil Test Reports and 705.03.01(d) or 705.03.02(d).
- (c) **Stockpiling.** If topsoil is stockpiled upon delivery for future use on the project, the stockpiling shall conform to 701.03.03.

**703.04 MEASUREMENT AND PAYMENT.** The payment will be full compensation for the preparation of surfaces, excavation, loading, hauling, placing, spreading, limestone and soil amendments, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

**703.04.01** Placing Furnished Topsoil will be measured and paid for at the Contract unit price per square yard for the surface area acceptably prepared and covered with topsoil to the depth specified.

**703.04.02** Placing Furnished Topsoil for Grading Adjustment will be measured and paid for at the Contract unit price specified in the Contract Documents.

## SECTION 704 - TEMPORARY SEEDING

**704.01 DESCRIPTION.** This work shall consist of furnishing and placing fertilizer, temporary seed and mulch on cuts, fills, stockpiled topsoil, and subsoil areas which cannot be shaped and permanently vegetated for an extended period of time as specified in the Contract Documents or as directed by the Engineer.

### 704.02 MATERIALS.

Fertilizer	920.03.01
Mulch Binder	904.05 and 920.05.04
Seed	920.04.01 and 920.04.02
Mulch	920.05.03 and 920.05.04
Water	920.08.01

**704.03 CONSTRUCTION.** Temporary seeding and temporary mulching shall be done any time of the year, as directed by the Engineer. Grading and shaping operations may be required before seeding.

### 704 03.01 Application Rates.

MATERIAL	LB PER 1000 FT <sup>2</sup> (kg/100 m <sup>2</sup> )	LB PER ACRE (kg/ha)
Temporary Seed Mix	2.9 (1.1)	125 (115)
Fertilizer (10-20-10)	17.2 (6.9)	750 (690)
Mulch (Straw or Hay)	91.8 (36.9)	4000 (3690)
Mulch Binder		
(a) Wood Cellulose Fiber	17.2 (6.9)	750 (690)
OR	<b>GALLONS PER 1000 FT<sup>2</sup> (l/100 m<sup>2</sup>)</b>	<b>GALLONS PER ACRE (l/ha)</b>
(b) Emulsified Asphalt	8.0 (32.7)	350 (3270)

**704.03.02 Temporary Seeding.** Temporary seeding shall consist of soil preparation, applying seed, fertilizer, and mulch.

(a) **Soil Preparation.** Soil shall be loosened from grading operations. Compacted soil surface shall be loosened as approved by the Engineer before seed is applied.

(b) **Seeding, Fertilizing, and Mulching.** Seeding, fertilizing and mulching shall conform to 705.03.01 and 705.03.02.

**704.03.03 Temporary Straw Mulching.** Temporary straw mulching shall conform to 705.03.01 and 704.03.02.

**704.03.04 Temporary Wood Cellulose Mulching.** Temporary wood cellulose mulching shall conform to 705.03.01 and 705.03.02.

**704.04 MEASUREMENT AND PAYMENT.** Temporary Seeding will be measured and paid for at the Contract unit price for one or more of the items listed below as specified in the Contract Documents.

The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. Replacing mulch due to the Contractor's negligence, as determined by the Engineer, shall be at the Contractor's expense. After acceptance, mulch requiring replacement, as directed by the Engineer, will be paid for as additional work or extra work.

**704.04.01** Temporary Seeding per pound.

**704.04.02** Temporary Straw Mulching per ton.

**704.04.03** Temporary Wood Cellulose Mulching per ton.

## **SECTION 705 - TURF ESTABLISHMENT**

**705.01 DESCRIPTION.** This work shall consist of soil preparation, seeding, fertilizing, mulching, liming as required, overseeding, refertilizing, and mowing all areas designated for turf establishment as specified in the Contract Documents or as directed by the Engineer.

**705.01.01 Regional Areas.** Maryland is divided into regions by counties as follows:

- REGION 1 — Garrett, Allegany and Washington  
(West of Clear Spring, MD);
- REGION 2A — Washington (East of Clear Spring, MD)  
and Frederick.
- REGION 2B — Carroll, Baltimore, Harford, Cecil, Howard,  
Montgomery, and Baltimore City.  
*Although Baltimore City is located within this  
region, it is not located within a state county.*
- REGION 3 — Anne Arundel, Prince Georges, Calvert, Charles,  
St. Marys, Kent, Queen Anne’s, Talbot, Caroline,  
Dorchester, Wicomico, Worcester and Somerset.

**705.01.02 Seeding Seasons and Seed Mixes.**

<b>SEEDING SEASONS AND SEED MIXES</b>						
<b>REGIONS SPRING AND FALL MONTH/DAY</b>			<b>SUMMER MONTH/DAY</b>		<b>LATE FALL MONTH/DAY</b>	
1	4/1 TO 6/15 and 8/1 TO 10/1		6/16 TO 7/31		10/2 TO 11/1	
2A, 2B	3/1 TO 5/15 and 8/1 TO 10/20		5/16 TO 7/31		10/21 TO 11/20	
3	3/3 TO 5/1 and 8/1 TO 10/31		5/2 TO 7/31		11/1 TO 11/30	
Region	(Roadsides) Seed Mix with Additive	(Medians) Seed Mix	(Roadsides) Seed Mix with Additive	(Medians) Seed mix with Additive	(Roadsides) Seed Mix with Additive	(Medians) Seed Mix with Additive
1	1 c	2	1ac	2a	1bc	2b
2A	1 c	2	1ac	2a	1bc	2b
2B	1d	2	1ad	2a	1bd	2b
3	1d	1	1ad	1a	1bd	1b
Seed Mix contents refer to 920.04.02			ADDITIVES			
1 = SHA Seed Mix No.1			a = Lovegrass or Foxtail Millet			
2 = SHA Seed Mix No.2			b = Rye Grain			
			c = Crown Vetch			
			d = Serecia Lespedeza			

NOTE: All regions. Crown Vetch shall be added to the seed mixes which are to be sown on ripplable rock.

Roadside areas are outside the edge of the roadbed, interchanges, and median areas with a slope of 3:1 and steeper.

Median areas are between divided highways flatter than 3:1 and at Administration facilities.

## **705.02 MATERIALS.**

Agricultural Limestone	920.02
Fertilizer	920.03.01
Mulch Binder	904.05 or 920.05.04
Seed	920.04.01 and 920.04.02
Mulch	920.05.03 and 920.05.04
Miscellaneous	920.08

**705.03 CONSTRUCTION.** Seeding shall be performed when the temperature is above 32 F (0 C) and the ground is not frozen.

**705.03.01 Seeding Roadside Areas.** Seeding shall consist of preparing soil and applying limestone, seed, fertilizer, and mulch.

- (a) **Preparing Soil.** Areas to be seeded shall conform to the specified finish grades and be free of any weed or plant growth. All areas (except serrated cut slopes) shall be loosened by discing, harrowing, raking or by other approved methods immediately prior to seeding, unless otherwise directed by the Engineer. The area shall be free of all clods, loose stones and other foreign materials larger than 3 in. (75 mm). On and adjacent to residential properties, the size of the loose stone and other foreign material shall not be larger than 1½ in. (38 mm). All gullies, washes or disturbed areas that develop subsequent to final dressing shall be repaired prior to seeding. The seed beds shall be as follows:

(1) Slopes less than 3:1:

The topsoil shall be loosened to a depth of 2 in. (50 mm).

(2) Slopes 3:1 and steeper:

The subsoil shall be loosened to a depth of 1 in. (25 mm).

(3) Serrated cut slopes:

The subsoil shall not be loosened. The areas shall be seeded and mulched in no greater than 50 ft (15 m) vertical increments.

**(b) Application Equipment.** Equipment shall consist of spreaders, drills, hydroseeders or other equipment approved by the Engineer for applying materials either in a wet or dry form. All equipment shall be calibrated before application to the satisfaction of the Engineer so that materials are applied accurately and evenly to avoid misses and overlaps.

Hydroseeders shall display maximum capacity in gallons (liters) and be equipped with an agitation system capable of keeping all the solids in a state of suspension.

The mixture shall be directed upward into the air so droplets will fall in a uniform spray to avoid erosion or runoff.

Mechanical seeders shall be capable of placing seed at the specified rate.

Hydroseeders and spinner spreaders shall not be used during periods of high winds.

**(c) Application Rates.**

<b>MATERIAL</b>	<b>LB PER 1000 FT<sup>2</sup> (kg/100 m<sup>2</sup>)</b>	<b>LB PER ACRE (kg/ha)</b>
<b>AGRICULTURAL LIMESTONE</b>		
(1) Salvaged Topsoil Areas*	Refer to Contract Documents.	Refer to SHA Soil Reports
(2) Furnished Topsoil Areas*		
(3) Nontopsoil Areas and Serrated Cut Slopes		
Region 1 Limestone		
Region 2A and 2B Limestone	137.7 (55.3)	6000 (5530)
Region 3 Dolomitic Limestone	114.8 (46.0)	5000 (4600)
Seed Mix No. 1 Roadside Areas	91.8 (36.9)	4000 (3690)
Increase Seed Mix No. 1 from 75 to 100 lb per acre (70 to 105 kg/100 m <sup>2</sup> ) if legumes are omitted while seeding adjacent to highway.	1.72 (0.7)	75 (70)
Seed Mix No. 1 or No. 2 Median Areas	2.30 (0.9)	100 (90)
Crown Vetch	0.18 (0.07)	8 (7)
Serecia Lespedeza	0.46 (0.2)	20 (20)
Lovegrass	0.05 (0.02)	2 (2)
Foxtail Millet	0.23 (0.09)	10 (9)
Rye Grain	0.51 (0.2)	22 (20)
<b>FERTILIZER</b>		
Topsoiled and Nontopsoiled Areas 10-22-22 (50% UF N )	23.0 (9.2)	1000 (920)
Nontopsoiled Areas 38-0-0 (UF)	4.6 (1.8)	200 (180)
Refertilizing 0-20-20	9.2 (3.7)	400 (370)
Refertilizing 38-0-0 (UF)	14.9 (6.0)	650 (600)
<b>MULCH</b>		
(1) Straw or Hay		
(a) Secured with Asphalt or Wood Cellulose Fiber	91.8 (36.9)	4000 (3690)
(b) Secured with Mulch Anchoring Tool	114.8 (46.0)	5000 (4680)
(c) Secured with Tracking Method	68.9 (27.6)	3000 (2760)
(2) Wood Cellulose Fiber	34.4 (13.8)	1500 (1380)
<b>MULCH BINDER</b>		
(a) Wood Cellulose Fiber OR	17.2 (6.9)	750 (690)
	<b>GALLONS PER 1000 FT<sup>2</sup> (l/100 m<sup>2</sup>)</b>	<b>GALLONS PER ACRE (l/ha)</b>
(b) Emulsified Asphalt	8.0 (32.7)	350 (3270)

\* Adjust to Ph 6.0 minimum

- (d) **Liming.** Agricultural limestone where required on topsoiled areas flatter than 3:1, shall be incorporated 2 in. (50 mm) into the topsoil before seed and fertilizer are applied. Agriculture limestone where required on all areas 3:1 and steeper, may be mixed with the seed and fertilizer.
- (e) **Seeding & Fertilizing.** Seed and fertilizer shall only be applied to previously prepared seedbeds.

When seed is applied with hydraulic seeders all mixtures shall be used within eight hours after mixing. Otherwise the mixture shall be wasted and disposed by means acceptable to the Engineer.

When sown with mechanical seeders, seed and fertilizer shall be incorporated to a depth not more than 1/4 in. (6 mm).

All leguminous seeds shall be inoculated as specified on the inoculant package label. The inoculant shall be stored at room temperatures, out of direct sunlight and away from heating units.

When leguminous seed is applied by hydraulic seeders, 10 times the quantity of inoculant required for dry leguminous seed application shall be used. Seed not used within one hour shall be reinoculated.

When leguminous seed is applied by mechanical seeders, the seed shall be dampened with water and mixed with the inoculant. The inoculated seed shall then be mixed with the other seed to be used. Inoculated seed not used within 24 hours shall be reinoculated.

- (f) **Mulching.** Within 48 hours after seeding, mulch shall be applied as follows:
- (1) **Straw or Hay Mulch.** Material shall be applied so no more than 10 percent of the soil surface is exposed. Mulch applied by blowers shall provide a loose depth of not less than 1/2 in. (13 mm) nor more than 2 in. (50 mm). Ninety five percent of the mulch shall be 6 in. (150 mm) or more in length. Mulch

applied by hand shall provide a loose depth of not less than 1½ in. (40 mm) nor more than 3 in. (75 mm).

(2) **Wood Cellulose Fiber Mulch.** Wood cellulose fiber will only be permitted on those areas where steep or high slopes prohibit the use of straw or hay application equipment or when approved by the Engineer. During summer seeding at least 70 percent of the hydromulch shall be applied after and separately from the seed and fertilizer.

(g) **Securing Straw or Hay Mulch.** Mulch shall be secured by any of the following methods:

(1) **Mulch Anchoring Tool Method.** This method shall be used for the summer seeding season on slopes 3:1 and flatter and all median areas on highways under traffic. Mulch shall be incorporated into the soil to a minimum depth of 2 in. (50 mm).

(2) **Tracking Method.** The mulch shall be incorporated into the soil with track type equipment having steel cleats with a minimum depth of 1½ in. (40 mm). The tracking shall be performed perpendicular to the slopes. The equipment used and the method of tracking shall be acceptable to the Engineer. Upon completion of tracking, the mulch shall be further secured as described for the mulch binding method in 705.03.01(g)(3).

(3) **Mulch Binding Method.** Mulch binder material shall be uniformly applied without displacing the mulch. A mix method may be used where the asphalt is sprayed into the straw or hay mulch as it leaves the mulch blower. Emulsified asphalt shall only be used with permission of the Engineer.

**705.03.02 Seeding Median Areas.** Seeding shall consist of preparing soil and applying limestone, seed, fertilizer and mulch.

(a) Preparing soil shall conform to 705.03.01 with the exception that the soil shall be loosened to a depth of 3 in. (75 mm).

- (b) Application equipment shall conform to 705.03.01.
- (c) Application rates shall conform to 705.03.01.
- (d) Agricultural limestone, if required, shall be applied separately and incorporated 3 in. (75 mm) into the seedbed.
- (e) Seeding and fertilizing shall conform to 705.03.01.
- (f) Mulching shall conform to 705.03.01.
- (g) Securing mulch shall conform to 705.03.01.

**705.03.03 Liming Nontopsoiled Areas.** This work shall consist of applying limestone only on nontopsoiled areas to be seeded.

**705.03.04 Applying UF Fertilizer.** This work shall consist of applying 38-0-0 (UF) fertilizer as an additive to nontopsoiled areas to be seeded.

**705.03.05 Overseeding Roadside Areas.** Overseeding roadside areas consists 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 mulch application. Work shall conform to 705.03.01 and as directed by the Engineer, except for requirements of soil preparation and mulch.

**705.03.06 Overseeding Median Areas.** Overseeding median areas consists 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 mulch application. Work shall conform to 705.03.02 and as directed by the Engineer, except for requirements of soil preparation and mulch.

**705.03.07 Refertilizing.** Refertilizing shall consist of applying 0-20-20 and 38-0-0 (UF) fertilizer to nontopsoiled and serrated cut slope areas and other areas as directed by the Engineer as follows:

REGIONS	NUMBER OF APPLICATIONS	MONTHS AFTER SEEDING
1, 2A and 2B	1	April or September
3	2	April and September

**705.03.08 Tractor Mowing.** Mowing shall consist of using a minimum 5 ft (1.5 m) flail or rotary tractor mower as directed by the Engineer, and shall conform to the Administration’s Mowing Standards. The vegetation shall be cut to 5 in. (125 mm) high before it reaches 20 in. (500 mm) high.

**705.03.09 Hand Mowing.** Mowing shall consist of using a minimum 19 in. (475 mm) hand mower as directed by the Engineer. Vegetation shall be cut to 3 to 4 in. (75 to 100 mm) high before it reaches 15 in. (375 mm) high.

**705.03.10 Repairing Defective Areas.** Before final acceptance, the Contractor shall repair or replace any seeding or mulching that is defective or damaged due to the Contractor’s negligence. When the Contractor elects to perform out of season work, the Contractor shall establish a good stand of grass of uniform color and density as approved by the Engineer. When it is not possible to make an adequate determination of the color, density and uniformity of the stand of grass, acceptance of the areas will be delayed until seeding requirements have been met.

**705.04 MEASUREMENT AND PAYMENT.** Turf Establishment will be measured and paid for at the Contract unit price for one of more of the items listed below as specified in the Contract Documents.

The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

**705.04.01 Seeding Roadside Areas per square yard.** Other seed such as leguminous and out of season seed will not be measured but the cost will be incidental to this item.

**705.04.02** Seeding Median Areas per square yard. Other seed such as leguminous and out of season seed will not be measured but the cost will be incidental to this item.

**705.04.03** Liming Nontopsoiled Areas per ton.

**705.04.04** Applying 38-0-0 (UF) Fertilizer per pound.

**705.04.05** Overseeding Roadside Areas per pound.

**705.04.06** Overseeding Median Areas per pound.

**705.04.07** Refertilizing 0-20-20 and 38-0-0 (UF) per pound for the combined weight of both fertilizers.

**705.04.08** Tractor Mowing per hour.

**705.04.09** Hand Mowing per hour.

**705.04.10 Repairing Defective Areas.** Except when the damage is due to the Contractor's negligence, once the Contractor has completed the seeding and mulching of any area as determined by the Engineer, no additional work at the Contractor's expense will be required. Subsequent repairs and replacements as required by the Engineer shall be made by the Contractor and will be paid for as additional work.

## **SECTION 706 - WOODY SHRUB SEEDING**

**706.01 DESCRIPTION.** This work shall consist of soil preparation, seeding, fertilizing, mulching, liming as required and refertilizing all areas designated for Woody Shrub seeding as specified in the Contract Documents, Section 705, or as directed by the Engineer.

**706.01.01 Seeding Season.** Seeding shall be done during any seeding season specified in 705.01.02.

**706.02 MATERIALS.**

Mulch Binder	904.05 and 920.05.04
Agricultural Limestone	920.02
Fertilizer	920.03.01
Seed	920.04.01 and 920.04.02(d) and (e)
Mulch	920.05.03
Water	920.08.01

**706.03 CONSTRUCTION.** Construction shall conform to 705.03 and the following:

**706.03.01 Seeding.** Seeding shall consist of soil preparation and applying seed, fertilizer and mulch. The Contractor shall provide the Cover Companion Seed Mix and the Administration will provide the Woody Shrub Seed Mix.

(a) Soil preparation shall be as specified in 705.03.01.

**(b) Application Rates.**

MATERIAL	LB PER 1000 FT <sup>2</sup>	LB PER ACRE
	(kg/100 m <sup>2</sup> )	(kg/ha)
Agricultural Limestone	Refer to 705.03.01(c)	
Woody Shrub Mix	1.15 (0.46)	50 (46)
Cover Companion Mix	0.80 (0.32)	35 (32)
Lovegrass	0.05 (0.02)	2 (2)
or Foxtail Millet	0.20 (0.09)	10 (9)
Rye Grain	0.51 (0.22)	22 (20)
Fertilizer:		
5-20-20	23.0 (9.2)	1000 (920)
38-0-0 (UF)	14.9 (6.0)	650 (600)
Refertilizing:		
0-20-20	9.2 (3.7)	400 (370)
38-0-0 (UF)	14.9 (6.0)	650 (600)
Mulch	114.8 (46)	5000 (4600)
Mulch Binder		
(a) Wood Cellulose Fiber OR	17.2 (6.9) <b>GALLONS PER 1000 FT<sup>2</sup> (l/100 m<sup>2</sup>)</b>	750 (690) <b>GALLONS PER ACRE (l/mha)</b>
(b) Emulsified Asphalt	8.0 (32.7)	350 (3270)

(c) **Seeding and Fertilizing.** Seeding and fertilizing shall conform to 705.03.01(e).

(d) **Securing Straw or Hay Mulch.**

(1) Securing straw or hay mulch shall conform to 705.03.01(g)(1).

(2) If the Contractor cannot conform to 705.03.01(g)(1), securing of mulch shall conform to 705.03.01(g)(2).

**706.03.02 Liming Nontopsoiled Areas.** Refer to 705.03.03.

**706.03.03 Applying 38-0-0 (UF) Fertilizer.** Refer to 705.03.04.

**706.03.04 Refertilizing.** Refertilizing shall be performed not less than three months after seeding. Refertilizing shall consist of applying 0-20-20 and 38-0-0 (UF) fertilizer to nontopsoiled and serrated cut slope areas and other areas as directed by the Engineer as follows:

REGIONS	NUMBER OF APPLICATIONS	MONTHS AFTER SEEDING
1, 2A and 2B	1	April or September
3	2	April and September

**706.04 MEASUREMENT AND PAYMENT.** Woody Shrub Seeding will be measured and paid for at the Contract unit price per pound for the item Cover Companion Seed Mix and one or more of the items listed below as specified in the Contract Documents. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

**706.04.01** Cover Companion Seed Mix per pound. Woody shrub seed, out of season seed, 5-20-20 fertilizer and mulch will not be measured but the cost will be incidental to this item.

**706.04.02** Liming Nontopsoiled Areas per ton.

**706.04.03** Applying 38-0-0 (UF) Fertilizer per pound.

**706.04.04** Refertilizing 0-20-20 and 38-0-0 (UF) per pound for the combined weight of both fertilizers.

## **SECTION 707 - WILDFLOWER SEEDING**

**707.01 DESCRIPTION.** This work shall consist of wildflower seeding as specified in the Contract Documents or as directed by the Engineer.

### **707.02 MATERIALS.**

Wildflower Seed Mix	920.04.02(f)
Companion Seed Mix	920.04.02(g)
Water	920.08.01
Herbicide	920.08.07
Marking Dye	920.08.08

### **707.03 CONSTRUCTION.**

**707.03.01 Seeding Seasons.** Seeding shall be done in each Region during the time listed when the ground is not frozen. Refer to Section 705 for Regions:

<b>REGIONS</b>	<b>SEEDING DATES</b>
1	Sept. 1 to May 1
2A and 2B	Oct. 1 to April 15
3	Oct. 15 to April 15

**707.03.02 Herbicide Application.** All vegetation in the seeding area shall be eradicated prior to seeding by use of a herbicide. Herbicide application shall conform to the Maryland Pesticide Applicator's Law and the

manufacturer's recommendations. Herbicide shall be glyphosate with a wetting agent mixed with water and a water soluble marking dye, applied at the following rates:

Herbicide — 5 lbs per acre (4.6 kg/ha) of active ingredient

Marking Dye — 6 to 15 oz per acre (440 to 1100 ml/ha)

Water — 40 to 50 gals per acre (375 to 470 l/ha)

The Contractor shall submit daily herbicide application reports to the Engineer using Administration forms.

**707.03.03 Mowing.** A minimum of two weeks after herbicide treatment, the seeded area shall be mowed to a maximum height of 1 in.(25mm). Clippings shall be removed prior to seeding.

**707.03.04 Seeding.** Seeding shall consist of soil preparation and sowing seed.

**(a) Soil Preparation.**

(1) Soil preparation is not required when using a drill seeder.

(2) Seeding area shall be rototilled to a depth of 1 in. (25 mm) prior to seeding when using a broadcast seeder.

**(b) Equipment.** Seeding equipment shall be approved by the Engineer. Seeds shall be planted using a drill or broadcast seeder. If a drill seeder is used, it shall be equipped with three seed boxes.

**(c) Application Rates and Methods.**

<b>MATERIAL</b>	<b>LB PER ACRE (kg/ha)</b>
Wildflower Seed	20 (18.4)
Hard or Sheep Fescue (Companion Seed)	10 ( 9.2)
Carrier, consisting of baked ground regular gradation calcine clay (cat litter) premixed with seed approved by the Engineer	20 (18.4)
<b>METHODS</b>	
<b>(a) Drill Seeder.</b> Seed mix shall be drilled through the dead turf and <b>thatch</b> into the soil to a depth of 1/4 in. (6 mm). Seed shall be premixed and placed in the seed boxes as follows:	
<b>BOX A - WILDFLOWER and COMPANION SEED</b>	
Black-Eyed Susan ( <i>Rudbeckia hirta</i> )	2.0 (1.84)
Corn Poppy ( <i>Papaver rhoeas</i> )	1.25 (1.15)
Gold Yarrow ( <i>Achillea filipendulina</i> )	0.2 (0.18)
Ox-Eyed Daisy ( <i>Chrysanthemum leucanthemum</i> )	1.0 (0.92)
Plains Coreopsis ( <i>Coreopsis tinctoria</i> )	1.0 (0.92)
White Yarrow ( <i>Achillea millefolium</i> )	0.2 (0.18)
Hard or Sheep Fescue ( <i>Festuca longifolia</i> or <i>Festuca ovina</i> )	10.0 (9.20)
<b>BOX B - WILDFLOWER SEED</b>	
Cornflower ( <i>Centaurea cyanus</i> )	1.25 (1.15)
Cosmos ( <i>Cosmos bipinnatus</i> )	1.6 (1.47)
Dame's Rocket ( <i>Hesperis matronalis</i> )	1.5 (1.38)
Evening Primrose ( <i>Oenothera hookeri</i> )	2.0 (1.84)
Lance-Leaved Coreopsis ( <i>Coreopsis lanceolata</i> )	2.0 (1.84)
Purple Coneflower ( <i>Echinacea purpurea</i> )	2.0 (1.84)
Rocket Larkspur ( <i>Delphinium ajacis</i> )	1.0 (0.92)
<b>BOX C - FLUFFY WILDFLOWER SEED</b>	
Gay Feather ( <i>Liatis spicata</i> ) with Awns - If without Awns, place in Box B Gaillardia ( <i>Gaillardia pulchella</i> )	2.0 (1.84)
<b>(b) Broadcast Seeder.</b> Seed mix shall be spread in a criss-cross pattern. After spreading, the mixture shall be lightly raked or dragged to a maximum depth of 1/8 in. (3 mm).	
	1.0 (0.92)

**707.04 MEASUREMENT AND PAYMENT.** Wildflower seeding will be measured and paid for at the Contract unit price per square yard. The payment will be full compensation for seed, herbicide, marking dye, mowing, soil preparation and seeding, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

## **SECTION 708 - SODDING**

**708.01 DESCRIPTION.** This work shall consist of soil preparation, liming, fertilizing, watering and placing grass sod on prepared areas, as specified in the Contract Documents or as directed by the Engineer.

**708.01.01 Regional Area.** Regional areas shall conform to 705.01.01.

**708.01.02 Regional Requirements.**

- (a) Bluegrass sod shall be used in Regions 1 and 2A.
- (b) Tall fescue sod shall be used in Regions 2B and 3.
- (c) Bermudagrass sod shall be used as directed by the Office of Environmental Design.

**708.02 MATERIALS.**

Agricultural Limestone	920.02
Fertilizer	920.03
Grass Sod	920.04.03
Staples	920.06.01
Water	920.08.01
Pegs	920.08.21

**708.03 CONSTRUCTION.**

**708.03.01 Sodding Season.** Sod shall be placed between the dates of August 15 and May 31. Sod shall not be placed on frozen soil and no frozen sod shall be used.

**708.03.02 General.** Sod shall be transported and installed without breaking, tearing or loss of soil. All sod shall be transplanted within 48 hours from the time it is harvested.

**708.03.03 Final Grading.** The areas to be sodded shall present a smooth, uniform surface true to line and cross section, and any raking required to accomplish this shall be done immediately prior to the placing of the sod at no additional cost.

**708.03.04 Liming and Fertilizing.** All areas to be sodded shall be limed and fertilized.

APPLICATION RATES		
MATERIAL	lb per 1000 ft <sup>2</sup> (kg/100 m <sup>2</sup> )	lb per acre (kg/ha)
Agricultural Limestone	91.8 (36.9)	4000 (3690)
Fertilizer		
10-10-10	20.7 ( 8.3)	900 (830)
38-0-0 (UF)	4.6 ( 1.8)	200 (185)

After the above materials have been applied, they shall be worked into the top 3 in. (75 mm) of soil.

**708.03.05 Placing.** Sod shall be placed with close joints and no overlapping. No cracks will be permitted between sod pieces. All sod shall be tamped or rolled after placing to close the seams between the sod pieces and to press the sod tight against the ground. A hand tamper shall weigh approximately 15 lb (7 kg) and have a flat surface of approximately 100 in.<sup>2</sup> (0.06 m<sup>2</sup>). A roller shall weigh 40 lb/ft (60 kg/m) of width. Any slipping of sod shall be corrected by the Contractor without additional compensation.

On slopes of 2:1 and steeper, sod shall be placed 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 parallel to the direction of the flow of the water.

Each strip or section of sod placed on slopes of 2:1 and steeper and

surface drainage V-shaped or flat bottom ditches or gutters shall be staked securely with at least two staples or wooden pegs spaced not more than 2 ft (0.6 m) apart and driven flush with the top of the sod.

**708.03.06 Initial Watering.** Each section of sod shall be thoroughly watered a minimum of three times after placement. The first watering of sod shall be within four hours after being placed and shall wet the soil to a depth of 3 in. (75 mm) below the sod. The second and third waterings shall be within 10 days after the sod is placed. A minimum of 24 hours shall elapse between the second and third watering.

**708.03.07 Refertilizing.** After the sod has been watered three times, and no later than three weeks after placing, it shall be refertilized with 38-0-0 (UF) fertilizer at the rate of 4.59 lb/1000 ft<sup>2</sup> (1.8 kg/100 m<sup>2</sup>) or 200 lb/acre (185 kg/ha).

**708.03.08 Acceptance.** At the time of acceptance all sod shall be firmly knitted, show signs of good health, and have received initial watering and refertilization.

**708.03.09 Additional Watering of Sod.** The Contractor shall monitor the water needs of the sod to maintain adequate moisture in the upper 4 in. (100 mm) of soil. At such time that additional watering is necessary, the Engineer shall be notified, and if the Engineer concurs, the Contractor shall begin watering immediately.

## **708.04 MEASUREMENT AND PAYMENT.**

**708.04.01** Sodding will be measured and paid for at the Contract unit price per square yard. The payment will be full compensation for all sod, initial waterings, staking, liming, fertilizing, refertilizing, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

**708.04.02 Additional Watering of Sod.** Additional Watering of Sod will be measured and paid for at the Contract unit price per 1000 gal of water applied to the sod. Water will be measured by means of satisfactorily installed meters, or by measurements of tank capacities, or by acceptable documentation of tanks of predetermined capacity. The Contractor shall

furnish the Engineer's representative with measurement and capacities to provide a complete and accurate record of the quantity of water furnished and applied. The payment will be full compensation for all water, material, labor, equipment, tools, and incidentals necessary to complete the work. No compensation will be allowed for water wasted or excess watering as determined by the Engineer.

## **SECTION 709 - SOIL STABILIZATION MATTING**

**709.01 DESCRIPTION.** This work shall consist of furnishing, placing and securing matting on seeded areas, as specified in the Contract Documents or as directed by the Engineer.

### **709.02 MATERIALS.**

Excelsior Matting	920.06
Staples	920.06.01

### **709.03 CONSTRUCTION.**

**709.03.01 General.** When topsoil is specified for areas where matting is to be placed, this work shall be completed before the soil stabilization matting operation is started.

**709.03.02 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 in the direction of water flow. Matting shall be laid smoothly and firmly upon the seeded surface, and stretching shall be avoided. Where more than one width of matting is required, the strips shall overlap at least 2 in. (50 mm). Ends shall overlap at least 6 in. (150 mm). The upgrade end of each strip of matting shall be turned down and buried to a depth of not less than 6 in. (150 mm) with the soil firmly tamped against it. Overlapping shall be done with the upgrade section on top. The Engineer

may require any other edge exposed to more than normal flow of water to be buried in a similar manner. Edges of matting shall be similarly buried around the edges of catch basins and other structures.

Matting shall be securely fastened in place with staples driven vertically into the soil and flush with the surface. Staples shall be placed 2 ft (0.6 m) apart along the edges and center of the matting. On all overlapping edges, staples shall be placed 18 in. (450 mm) apart. At all ends of the matting, staples shall be placed 6 in. (150 mm) apart.

**709.04 MEASUREMENT AND PAYMENT.** Soil Stabilization Matting will be measured and paid for at the Contract unit price per square yard of area covered. Should the top netting degrade before the disturbed area is fully stabilized, the Contractor shall replace the soil stabilization matting and reseed the affected area at the Contractor's expense. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Where required, seeding, overseeding, placing salvaged topsoil, placing furnished topsoil, and seeding and mulching will be measured and paid for separately at the Contract unit price for the respective item specified in the Contract Documents.

## **SECTION 710 - PLANTING TREES, SHRUBS, VINES & SEEDLING STOCK**

**710.01 DESCRIPTION.** This work shall consist of furnishing and planting trees, shrubs, vines and seedling stock and all plant establishment operations to complete the work as specified in the Contract Documents or as directed by the Engineer.

**710.01.01 Planting Schedule.**

DECIDUOUS MATERIAL				EVERGREEN MATERIAL		
SEASON	BALLED AND BURLAPPED AND BARE ROOT	CONTAINER GROWN	SEEDLING STOCK	BALLED AND BURLAPPED	CONTAINER GROWN	SEEDLING STOCK
Spring	3/1 to 4/30	3/1 to 6/15	3/15 to 4/15	3/15 to 4/30	3/15 to 6/15	3/15 to 4/15
Fall	10/15 to 12/15	8/15 to 12/15	—	9/1 to 11/15	8/15 to 11/15	10/1 to 10/31

Bare root plants shall not be planted while in leaf or during periods of freezing weather. No container grown plant material shall be planted if not acclimated to the current weather conditions. No planting will be allowed out of season without written permission of the Engineer.

**710.02 MATERIALS.**

Fertilizer	920.03.02 and 920.03.04
Wood Chips	920.05.02
Plant Materials	920.07
Miscellaneous	920.08

**710.03 CONSTRUCTION.**

**710.03.01 Plant Storage and Handling.** The Contractor shall provide adequate facilities for the protection, watering and temporary storage of plant material.

- (a) **Bare Root (BR) Material.** Following delivery and inspection at the storage area, all bare root plant material shall be heeled-in and maintained in moist soil or other suitable material until planted, as directed by the Engineer. Plants being transported to and from the heel-in area shall have their roots protected from drying by means of covering with canvas, burlap, or straw and shall be kept moist.

- (b) **Balled and Burlapped (B and B).** Root balls shall be kept moist at all times. If not planted within seven days after delivery, the root balls shall be covered with mulch or straw and kept watered until removed for planting. Care shall be taken to prevent damage to trunks, branches and roots. The integrity of the root balls shall be carefully preserved.

**710.03.02 Preparation for Planting.** The Contractor shall perform all layout, bed preparation and soil amendment as follows:

- (a) **Layout.** The Contractor shall provide the stakes, and stake out the locations of all pits and the outlines of all seedling areas and plant beds as specified in the Contract Documents. No work shall be started until the locations and outlines are approved by the Engineer.

Outline stakes for seedling areas shall be spaced 30 ft (10 m) apart or as directed by the Engineer. They shall be driven approximately 1 ft (0.3 m) into the ground and remain as a permanent means of outline identification through the life of the Contract.

- (b) **Plant Bed Preparation.** Existing weed growth in planting beds shall be sprayed with glyphosate with wetting agent conforming to the Maryland Pesticide Applicator's Law and to the manufacturer's recommendations.

After a minimum of seven days following herbicide application and prior to secondary weed growth, all planting beds shall be mowed to a height of 1 in. (25 mm). After mowing, woody material and debris shall be removed.

On flat areas and slopes less than 4:1, 1 in. (25 mm) of composted sewage sludge shall be spread over the entire surface of the planting bed and rototilled to provide a depth of 6 in. (150 mm) of loose soil. After rototilling, plant beds shall be raked to provide an even planting surface, removing loose stones greater than 3 in. (75 mm) and other foreign material.

Plant beds on slopes 4:1 and steeper do not require surface application of sludge or rototilling.

(c) **Plant Pit Soil Amendments.** Mixing soil amendments shall be confined to the plant pit and the immediate surrounding area. Soil shall not be mixed while in a muddy or frozen condition. Soil clods 2 in. (50 mm) or greater shall be pulverized before mixing.

(1) Soil for plants in the Heath Family (Ericaceous plants, i.e., Azaleas, Mountain Laurel, Sourwood, etc.) shall consist of existing soil into which the Contractor shall thoroughly incorporate 20 percent peat moss by volume. Based on Administration Soil Test Reports, the pH of soil shall be corrected by mixing iron sulfate or other soil pH modifiers approved by the Engineer to provide a pH range from 4.0 to 5.0.

(2) Soil for other plants except members of the Heath Family shall consist of existing soil at each planting pit location into which the Contractor shall thoroughly incorporate 20 percent by volume of composted sewage sludge, peat moss or other approved organic soil amendments.

(d) **Plant Pit Dimensions.** Plant pit dimensions are based on standard ball and container sizes established in the American Standard for Nursery Stock. All plant pit dimensions shall be as specified in the Contract Documents and as follows:

STOCK	HEIGHT/SPREAD	PIT DIMENSIONS	
		DIAMETER, in. (mm)	DEPTH, in. (mm)
Deciduous & Evergreen Shrubs & Trees B & B	-	2 times the ball diameter	Equal to ball depth
Deciduous & Evergreen Shrubs & Trees Container Grown		3 times the ball diameter -	Equal to ball depth
Deciduous Bare Root Trees	18 in. (460 mm) & 2 ft (0.6 m)	22 (560)	10 (250)
	3 ft (0.9 m) & 4 ft (1.2 m)	26 (660)	10 (250)
	5 ft (1.5 m) & 6 ft (2 m)	30 (750)	12 (300)
	7 ft (2.1 m) & 8 ft (2.4 m)	32 (800)	12 (300)
Deciduous & Evergreen Seedling Stock	6 in. (150 mm) & 12 in. (300 mm)	18 (460)	8 (200)
Deciduous Bare Root Shrubs	18 in. (460 mm)	18 (460)	10 (250)
	2 ft (0.6 m)	20 (500)	10 (250)
	3 ft (0.9 m)	24 (600)	12 (300)
	4 ft (1.2 m)	28 (700)	12 (300)
Vines	<b>SIZE</b>		
	2¼ in. (56 mm) Peat Pot	12 (300)	6 (150)
	3 in. (75 mm) Peat Pot or Container	18 (460)	6 (150)
	4 in. (100 mm) Container	18 (460)	8 (200)
	1 Gallon (3.8 l) Container	18 (460)	8 (200)

**710.03.03 Plantings.** The Contractor shall perform all planting, fertilizing, supporting, pruning, mulching and initial watering operations conforming to the following:

- (a) **General.** Plants shall be placed in planting pits in a vertical position with the root collars at the proper height. Amended soil shall be placed under and around roots to stabilize them in position. The root collars shall be placed at the following levels:

TYPE OF SOIL	COLLAR HEIGHT
Well drained	same level as the existing grade
Compacted	1 to 2 in. (25 to 50 mm) above the existing grade
Wet, poorly drained, or designated wetlands	1/4 of root mass above the existing grade

For wet, poorly drained, or designated wetlands, approved topsoil mixed with 20 percent by volume of composed sewage sludge, peat moss or other approved organic soil amendments, shall be placed on top of the planting pit and tapered to the existing grade at the edge of the planting pit as specified in the Contract Documents.

The burlap on the tops of plant balls shall be loosened and spread away or cut away from the entire top portion of the plant ball. The roots of bare root plants shall be spread carefully in a natural position and amended soil shall be worked around roots. Containers shall be removed from the root mass and the fibrous roots loosened around the perimeter of the ball to eliminate possible root-bound conditions. Amended soil for all plants shall be lightly compressed to eliminate major air pockets. Planting soil shall be thoroughly saturated with water during the planting process to settle soil, eliminate air pockets and to provide for initial water needs of the plants.

During the planting process, fertilizer tablets or other approved slow release fertilizers shall be placed around plant roots in conformance with the manufacturer's recommendations.

Care shall be taken during the backfilling, soil compressing and watering to avoid injuring the roots.

Individually planted trees and shrubs shall have a 4 in. (100 mm) high berm of excavated soil placed outside the rim of the pit to form

a saucer. Plants on slopes 4:1 and steeper shall have soil excavated from the uphill rim of the pit and a berm built on the downhill rim.

Plants in beds, except trees, shall not require berms. A 4 in. (100 mm) high shoulder of excavated soil shall be placed at the lower edge of all beds on slopes 4:1 and steeper.

Berms and shoulders for planting shall be compacted and graded to the satisfaction of the Engineer.

- (b) **Tree Staking and Guying.** Shade and flowering trees specified at 6 ft (2 m) in height or greater sizes and all evergreen trees specified at 5 ft (1.5 m) in height or greater sizes require supports. Other trees shall be supported as specified in the Contract Documents and as follows:

<b>STOCK</b>	<b>HEIGHT H TO CALIPER C</b>	<b>HEIGHT ft (m)</b>	<b>SUPPORTS REQUIRED</b>
<b>Shade Trees</b>	— 8 ft (2.4 m) H to 2 in. (50 mm) C	6 (2) —	2 stakes 6 ft (2 m) high 2 stakes 8 ft (2.4 m) high
	2½ in. (65 mm) H to ¾ in. (90 mm) C	—	3 stakes 10 ft (3 m) high
	4 in. (100 mm) C & over	—	3 guy wires attached to approved tree anchors
<b>Flowering Trees</b>	6 ft (2 m) H to 2½ in. (63 mm) C	—	2 stakes 5 to 8 ft (1.5 to 2.4 m) high as required
	3 in. (75 mm) C & over	—	3 guy wires attached to approved tree anchors
<b>Evergreen Trees</b>	—	5 & 6 (1.5 & 2)	2 stakes 5 to 6 ft (1.5 to 2 m) high as required
	—	7, 8 & 9 3 (2.1, 2.4 & 3)	stakes 7 to 8 ft (2.1 to 2.4 m) high as required
	—	10 (3) and over	3 guy wires attached to approved tree anchors

When driving stakes and installing anchors, the Contractor shall not damage trees. Each stake shall be positioned 5 to 8 in. (125 to 200 mm) away from the edge of the ball and driven into solid bearing ground to a minimum depth of 10 in. (250 mm) or more if required to support the plant. After stakes are driven, they shall be vertical. Stakes and guys shall support trees in a vertical position. All tree staking and guying shall be completed the same day as planting.

Staking and guying shall be performed as specified in the Contract Documents or as directed by the Engineer.

- (c) **Mulching.** All plant beds and pits shall be mulched with wood chips to a minimum thickness of 3 in. (75 mm), including soil berms and shoulders. Prior to the application of the mulch, 38-0-0 (UF) fertilizer shall be evenly applied at the rate of 10 lb/1000 ft<sup>2</sup> (4.88 kg/100 m<sup>2</sup>). The mulch shall be raked to an even surface to the limits specified in the Contract Documents or as directed by the Engineer.
- (d) **Pruning.** All deciduous trees under 6 ft (2 m) in height and shrubs shall be pruned after inspection on the site as directed by the Engineer, with care being taken to preserve the natural appearance of the plant. Deciduous trees greater than 6 ft (2 m) in height shall be pruned before planting.
- (e) **Cleanup.** During the course of planting, excess and waste materials shall be promptly removed, the turf areas kept clean and all reasonable precautions taken to avoid damage to existing structures, plants and grass.

**710.03.04 Plant Care During Construction.** Plant care shall begin immediately after each plant is installed and shall continue through the landscape construction phase as specified in 710.03.06(b) and (c).

**710.03.05 Construction Phase Acceptance.** The Contractor shall submit in writing a request to the Engineer for acceptance of the Construction Phase. The Engineer will grant acceptance when the landscape project has been substantially completed and the following requirements have been met:

- (a) Plant materials show evidence of having been successfully transplanted.
- (b) Unacceptable plants have been replaced.
- (c) Planting pits and planting beds are weed free.
- (d) Damaging pests have been controlled.
- (e) Dead wood has been pruned.
- (f) Trees have been straightened.
- (g) Staking and guying have been repaired.
- (h) Washouts in and around planting pits and beds have been repaired and mulch has been replaced as required.
- (i) Plants have been watered as necessary.
- (j) All other required work has been completed.

**710.03.06 Plant Establishment.** The Contractor shall maintain and establish the plants for a period of one year.

- (a) **Beginning.** Upon acceptance of the Construction Phase by the Engineer, the one year period of establishment will begin.
- (b) **Maintenance.** The Contractor shall maintain all plants in conformance with the original specifications and as follows:
  - (1) **Watering.** The Contractor shall monitor the water needs of all plants. When the Contractor feels watering is necessary, the Engineer shall be notified. If the Engineer concurs, the Contractor shall begin watering immediately.

If the Contractor fails to water when and as required, the Engineer will notify the Contractor and watering shall begin within 24 hours. The Contractor shall continue to water daily until all plant pits in the Contract have been watered unless otherwise directed by the Engineer. Each watering shall be completed within five days of the day on which watering was designated to begin.

All watering shall be accomplished using an open end hose or watering probe. Water shall be applied at low water pressure directly to each planting pit, allowing water to be absorbed into the planting pit soil until saturated, but without runoff.

**(2) Weed Control.** All undesirable vegetation growing within mulched areas shall be eradicated using glyphosate with a wetting agent in conformance with the manufacturer's recommendations. During each growing season, the Engineer and the Contractor will inspect the site on or about May 30, July 15 and August 30 to determine if weed control is acceptable. Eradication shall be performed prior to these inspections.

All weeds greater than 6 in. (150 mm) in height shall be cut down and removed from the project. Any remaining live weed growth shall be retreated until eradicated.

All herbicide applications shall be as specified in the Maryland Pesticide Applicator's Law and in conformance with the manufacturer's recommendations. The Contractor shall provide a Certified Applicator of Pesticides (Category III O or VI). Daily herbicide application reports shall be maintained by the Contractor. A completed copy for each day of application shall be provided to the Engineer.

The Contractor shall be responsible for replacing and pruning any plant material which is killed or excessively damaged through any act of negligence by the Contractor in applying and handling of the herbicide on the project.

- (3) Pest Management.** The Contractor shall institute an Integrated Pest Management (IPM) Program. The Contractor shall periodically inspect the project for plant pests during each growing season. When damaging pest infestations are observed, they shall be controlled.

All pesticide applications shall be as specified in the Maryland's Pesticide Applicator's Law and in conformance with the manufacturer's recommendations. The Contractor shall provide a Certified Applicator of Pesticides (Category III O or VI). Daily pesticide application reports shall be maintained by the Contractor. A completed copy for each day of application shall be provided to the Engineer.

If the Contractor fails to monitor and control plant pests prior to damage, the Contractor will be notified to begin pest control operations within 24 hours, until all damaging pests have been controlled.

- (4) Refertilization.** When required, and as directed by the Engineer, plants shall be fertilized with a solution of 20-20-20 or other approved analysis water soluble fertilizer designed for the liquid fertilization of plants as specified in the manufacturer's recommendations.

- (c) Removal and Replacement.** The Contractor shall promptly remove from the project all unacceptable plants. Plant replacement shall be made as originally specified. All unacceptable plants shall be replaced during each planting season. If between planting seasons, they shall be replaced during the next proper planting season.

- (d) Final Acceptance.** The Contractor shall submit a written request to the Engineer for a final acceptance of the landscaping on the project.

**710.03.07 Plant Relocation.** If the Engineer determines that plant locations are undesirable and conform to this Section, the plants shall be relocated as directed by the Engineer. When directed, the Contractor shall

begin removing plants within five working days and continue daily relocation operations until work is complete. Backfilling of abandoned planting pits shall conform to 710.03.08.

**710.03.08 Abandoned Planting Pits.** When the Engineer directs that an excavated plant pit be abandoned, the Contractor shall backfill the pit with the excavated soil or approved backfill. The backfill shall be compacted in 8 in. (200 mm) layers to the finished grade. Preparation and seeding of the disturbed area shall conform to Section 705.

## **710.04 MEASUREMENT AND PAYMENT.**

**710.04.01** Planting Trees, Shrubs, Vines & Seedling Stock will be measured and paid for at the Contract unit price per each item specified in the Contract Documents. The payment will be full compensation for all material, labor, equipment, tools, and incidentals (including watering during the construction period) necessary to complete the work. If at any time during the Contract period any plants become unacceptable, they shall be replaced at the Contractor's expense.

**710.04.02 Mulching.** All Wood Chip Mulch within the planting beds will be measured and paid for at the Contract unit price per square yard. The measurement will be computed on the surface area of the specified thickness before settling or as directed by the Engineer. The payment will be full compensation for all mulch, material, labor, equipment, tools, and incidentals necessary to complete the work.

**710.04.03 Additional Watering of Plants.** Additional Watering of Plants will be measured and paid for during the plant establishment period at the Contract unit price per 1000 gallons of water applied to the plants. Water will be measured by means of satisfactorily installed meters, or by measurement of tank capacities, or by acceptable documentation of tanks of predetermined capacity. The Contractor shall furnish the Engineer's representative with measurements and capacities to provide a complete and accurate record of the quantity of water furnished and applied. The payment will be full compensation for all water, material, labor, equipment, tools, and incidentals necessary to complete the work. No compensation will be allowed for water wasted or excess watering as determined by the Engineer.

**710.04.04 Plant Relocation.** Plant relocation will be measured and paid for at the Contract unit price per cubic foot for the specified planting pit. The payment will be full compensation for plant relocating, placing all backfill, seeding of damaged turf, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

**710.04.05 Abandoned Planting Pits.** Abandoned planting pits will be measured and paid for at the Contract unit price per cubic foot measured prior to backfilling. The payment will be full compensation for placing all backfill, seeding of damaged turf, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

**710.04.06 Plant Refertilization.** Plant Refertilization will be measured and paid for at the Contract unit price per 1000 gallons of liquid fertilizer mixture applied to the plants in conformance with 710.04.03. The payment will be full compensation for furnishing fertilizer, water, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

**SECTION 711 - PLANTING ANNUALS,  
PERENNIALS AND FALL PLANTED BULBS**

**711.01 DESCRIPTION.** This work shall consist of furnishing and planting annuals, perennials and fall planted bulbs and all plant establishment operations to complete the work as specified in the Contract Documents or as directed by the Engineer.

**711.01.01 Planting Schedule.**

PLANTS	PLANTING DATES
Container Grown Annuals	May 10 to June 1
Container & Field Grown Perennials Including Ornamental Grasses	April 15 to June 30 OR September 1 to October 30
Fall Planted Bulbs	October 1 to November 30

## 711.02 MATERIALS.

Agricultural Limestone	920.02
Fertilizer	920.03
Shredded Hardwood Bark	920.05.01
Miscellaneous	920.08

## 711.03 CONSTRUCTION.

**711.03.01 Storage and Handling.** The Contractor shall provide adequate facilities for the protection, watering and temporary storage of all plant material.

### 711.03.02 Preparation for Planting.

- (a) **Layout.** The Contractor shall lay out the location of all beds in the field prior to performing any planting operations as approved by the Engineer.
- (b) **Planting Bed Preparation.** Two weeks prior to planting, all weeds and grass located within planting bed areas shall be eradicated using glyphosate with a wetting agent in conformance with the Maryland Pesticide Applicator's Law and the manufacturer's recommendations. After the weeds have died, the planting bed areas shall be mowed to a height of 1 in. (25 mm) and the debris shall be removed prior to tilling as directed by the Engineer. Prior to rototilling, the following soil amendments shall be evenly spread over the planting bed:
- (1) 2 in. (50 mm) composted sewage sludge.
  - (2) 15 lb/1000 ft<sup>2</sup> (6 kg/100 m<sup>2</sup>) of 5-10-10 fertilizer.
  - (3) Lb/1000 ft<sup>2</sup> (kg/100 m<sup>2</sup>) of dolomitic agricultural limestone or other Ph modifier as determined by the Administration Soil Tests Reports.

After spreading the soil amendments, the planting bed shall be rototilled to provide a depth of 6 in. (150 mm) of loose soil with a rototiller approved by the Engineer. Soil shall not be worked in a wet or frozen condition. After tilling, the planting bed shall be raked to provide an even planting surface to remove debris and loose stones larger than 1 in. (25 mm). All debris shall be removed from the site and disposed of by the Contractor.

**711.03.03 Planting.** Plants shall not be installed until inspected as specified in 920.07.03. When planting in existing beds, the mulch and existing plants shall not be disturbed.

- (a) **Annuals and Perennials.** Prior to planting, container grown plants shall be removed from pots without being damaged. Annuals and perennials shall be planted through premulched cultivated beds with the mulch carefully pulled back and replaced to avoid mixing soil and mulch. When planted, the top of the root mass shall be at ground level and the plant shall be in a vertical position.
- (b) **Fall Planted Bulbs.** Prior to planting, all annuals shall be removed. Fall planted bulbs shall be planted at the depth recommended by the supplier for each specified variety of bulb. Bulbs shall be carefully handled to avoid bruising.
- (c) **Initial Watering.** Plants shall be watered the same day planted plus two waterings at weekly intervals. The waterings shall provide full and thorough saturation of the soil in the planting bed. A sprinkler or breaker nozzle shall be used to avoid water pressure damage to the plants or disturbance of the mulch.
- (d) **Fertilizing.** After the initial watering, a water soluble 20-20-20 fertilizer shall be applied to each plant as specified in the manufacturer's recommendations.
- (e) **Mulching.**
  - (1) **Annuals and Perennials.** Prior to planting, a 1½ in. (40 mm)

layer of mulch shall be spread over the prepared planting bed. After planting, an additional ½ in. (13 mm) shall be evenly spread over the bed.

- (2) **Fall Planted Bulbs.** After planting, a 2 in. (50 mm) layer of mulch shall be spread over the planting bed.
- (3) **Edging.** Upon completion of planting, mulch beds shall be neatly edged to a depth of 3 in. (75 mm) with a vertical cut, tapered back to the area to be mulched.

(f) **Refertilization.** Refertilization shall conform to 710.03.06(b)(4).

**711.03.04 Plant Care During Construction.** Plant care shall begin immediately after each plant is installed and shall continue through the landscape construction phase and as specified in 711.03.05.

**711.03.05 Plant Establishment.** Plant establishment shall conform to 710.03.06 modified as follows:

- (a) After the initial three waterings have been completed, plants shall be watered as required at the rate of 60 gal/100 ft<sup>2</sup> (244 l/100 m<sup>2</sup>) of planting bed, equivalent to 1 in. (25 mm) of rainfall.
- (b) Annuals shall be replaced immediately during the normal growing season when directed by the Engineer.
- (c) Annuals shall be removed after they have declined in the late summer or fall. The dead leaves and flower stems of most perennials shall be removed in the fall as directed by the Engineer. The leaves and flower stems of fall planted bulbs shall be removed in the summer after they have died back.

## **711.04 MEASUREMENT AND PAYMENT.**

**711.04.01** Installation of Annuals, Perennials and Fall Planted Bulbs will be measured and paid for at the Contract unit price per each item as specified in the Contract Documents. The payment will be full compensation for all

plants, bulbs, initial waterings, fertilizing, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. If at any time during the Contract period any plants become unacceptable, they shall be replaced at the Contractor's expense.

**711.04.02 Mulching.** Shredded Hardwood Bark Mulch within the planting beds will be measured and paid for at the Contract unit price per square yard. The measurement will be computed on the surface area of the specified thickness before settling or as directed by the Engineer. The payment will be full compensation for all mulch, material, labor, equipment, tools, and incidentals necessary to complete the work.

**711.04.03 Additional Watering of Plants.** Additional Watering of Plants will be measured and paid for at the Contract unit price per 1000 gallons of water applied to the planting beds. Water will be measured by means of satisfactorily installed meters, or by measurement of tank capacities, or by acceptable documentation of tanks of predetermined capacity. The Contractor shall furnish the Engineer's representative with measurements and capacities to provide a complete and accurate record of the quantity of water furnished and applied. The payment will be full compensation for all water, material, labor, equipment, tools, and incidentals necessary to complete the work. No compensation will be allowed for water wasted or excess watering as determined by the Engineer.

**711.04.04 Plant Refertilization.** Plant Refertilization will be measured and paid for at the Contract unit price per 1000 gallons of liquid fertilizer mixture applied to the plant beds in conformance with 711.04.03. The payment will be full compensation for furnishing fertilizer, water, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

## **SECTION 712 - SELECTIVE TREE TRIMMING**

**712.01 DESCRIPTION.** This work shall consist of selective tree trimming as specified in the Contract Documents or as directed by the Engineer and in conformance with the Maryland Department of Natural Resources' Roadside Tree Law.

## **712.02 MATERIALS.**

Tree Wound Dressing

920.08.20

## **712.03 CONSTRUCTION.**

**712.03.01 Equipment.** All pruning tools used shall conform to the accepted arboricultural practices as directed by the Engineer.

**712.03.02 Operation.** All work shall be performed by personnel under the supervision of a Maryland Licensed Tree Expert.

**712.03.03** All pruning shall conform to the current edition of the National Arborist Association Pruning Standards for Shade Trees. The class of tree trimming to be performed shall be identified in the Contract Documents and as directed by the Engineer. All pruning cuts greater than 3 in. (75 mm) in diameter shall be treated with an approved tree wound dressing for aesthetic reasons unless otherwise directed by the Engineer.

**712.03.04** All wood, branches and debris shall be removed as directed by the Engineer and disposed of by the Contractor.

**712.04 MEASUREMENT AND PAYMENT.** Selective Tree Trimming will not be measured for payment but will be paid for at the Contract lump sum price. In the event of a change in the number of trees included under this item, payment will be adjusted on the basis of the Contractor's breakdown of the lump sum bid. This breakdown shall be submitted by the Contractor to the Engineer within 10 days after the Notice To Proceed. The Contractor's breakdown shall list each class of selective tree trimming specified in the Contract Documents with a tabulation of the numbers and sizes of trees included under each class of tree trimming and the individual prices for each unit included in the lump sum bid. The total of the individual units shall equal the lump sum price bid.

The size designation under which each class of selective tree trimming is performed will be determined in conformance with the following schedule of pay sizes. The caliper of a tree shall be the diameter at breast height measured 4½ feet above the ground.

<b>TREE SIZE DESIGNATION</b>	
<b>TREE CALIPER IN INCHES (millimeters)</b>	<b>PAY SIZE IN INCHES (millimeters)</b>
under 10 (250)	6 (150)
10+ to 18 (250+ to 460)	14 (350)
18+ to 26 (460+ to 650)	22 (550)
26+ to 34 (650+ to 850)	30 (750)
34+ to 42 (850+ to 1050)	38 (950)
42+ to 46 (1050+ to 1150)	44 (1100)
over 46+ (1150+)	50 (1250)

The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

## **SECTION 713 - SELECTIVE TREE THINNING**

**713.01 DESCRIPTION.** This work shall consist of the selective thinning and disposing of undesirable live and dead trees, shrubs and vegetation, selective pruning of trees to be saved and removing and disposing of wind-falls, logs, stumps and rubbish as specified in the Contract Documents or as directed by the Engineer and in conformance with the Maryland Department of Natural Resources' Roadside Tree Law.

### **713.02 MATERIALS.**

Furnished Topsoil	920.01.02
Herbicide	920.08.07
Marking Dye	920.08.08
Tree Wound Dressing	920.08.20

## **713.03 CONSTRUCTION.**

### **713.03.01 Equipment.** Refer to 712.03.01

**713.03.02 Operation.** All work shall be performed by personnel under the supervision of a Maryland Licensed Tree Expert. The Contractor shall notify the Engineer 10 days prior to the beginning of any selective thinning work.

All work to be performed under this Section shall be completed before any new planting is performed in selective thinning areas as directed by the Engineer.

Growth to be removed will be marked by the Engineer. Dead wood in shrubs shall be removed as determined by the Engineer. Trees shall be pruned by removing all branches and stubs up to 15 ft (4.6 m) in height. All cuts over 3 in. (75 mm) in diameter, visible from the public right-of-way shall be painted with tree wound dressing. Trees and shrubs to be saved shall not be harmed by the Contractor. Injuries to bark, trunks and limbs shall be repaired by properly cutting, smoothing, tracing the bark and painting as directed by the Engineer.

When undesirable growth is removed, it shall be cut as nearly flush with the ground surface as feasible. Trees which cannot be felled without danger to traffic or injury to other plants or property shall be cut in sections from the top down.

In open areas where mowing is to be performed, stumps shall be completely removed to a minimum of 8 in. (200 mm) below the ground surface. The stump hole shall be backfilled with approved topsoil to the adjacent ground surface and seeded as specified in Section 705.

**713.03.03 Herbicide Application.** Where regrowth from stumps is not desired, the exposed bark and cut surfaces shall be thoroughly saturated with an approved herbicide solution to which marking dye has been added. This mixture shall be applied the same day the plant is cut. If suckering occurs, the herbicide treatment shall be continued until no signs of regrowth occur.

The herbicide shall be mixed and used as directed by the Engineer and in conformance with the manufacturer's recommendations.

Application of herbicide shall conform to the Maryland Pesticide Applicators' Law. The Contractor shall provide a Certified Applicator of Pesticides (Category III O or VI).

**713.03.04 Removal and Disposal.** All trimmings, dead wood, windfalls, logs, stumps and rubbish shall be removed as directed by the Engineer and disposed of by the Contractor.

**713.03.05 Site Restoration.** When selective thinning in an area has been completed, the area shall be thoroughly cleaned. Existing turf areas which have been injured by the work shall be regraded and seeded or sodded, and the entire area shall be neat and clean as directed by the Engineer.

**713.04 MEASUREMENT AND PAYMENT.** Selective Thinning will be measured and paid for at the Contract unit price per acre. The payment will be full compensation for all herbicide, wound dressing, stump removal, backfill, site restoration, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Outer measurements will be taken from the drip line.

## **SECTION 714 - SELECTIVE TREE FELLING**

**714.01 DESCRIPTION.** This work shall consist of felling trees as specified in the Contract Documents or as directed by the Engineer and in conformance with the Maryland Department of Natural Resources' Roadside Tree Law.

**714.02 MATERIALS.** Not applicable.

**714.03 CONSTRUCTION.**

**714.03.01 Equipment.** Refer to 712.03.01.

**714.03.02 Operation.** All work shall be performed by personnel under the supervision of a Maryland Licensed Tree Expert. Tree felling operations are:

- (a) **Operation 1.** Operation 1 shall consist of felling and removal of trees in mowed areas. The stump shall be removed or ground to a minimum depth of 8 in. (200 mm) below the ground surface. The stump hole shall be backfilled level with the adjacent ground surface using approved topsoil and seeded and mulched as specified in Section 705. All wood debris shall be removed from the site and disposed of by the Contractor.
  
- (b) **Operation 2.** Operation 2 shall consist of felling and removal of trees in areas that are not mowed. The trees shall be felled and the stumps shall be cut to a maximum height of 4 in. (100 mm) above the ground surface. All wood and debris shall be removed from the site and disposed of by the Contractor.
  
- (c) **Operation 3.** Operation 3 shall consist of felling of trees to prevent damage to adjacent trees and structures. The stumps shall be cut to a maximum height of 4 in. (100 mm) above the ground surface. All branches on felled trees extending 3 ft (0.9 m) or more above the ground surface shall be cut off. Removal of the felled trees and the cut branches will not be required.

**714.04 MEASUREMENT AND PAYMENT.** Selective Tree Felling will not be measured for payment but will be paid for at the Contract lump sum price. The Contractor shall submit a breakdown tabulation within 10 days after the Notice To Proceed. The Contractor's breakdown shall list each selective tree felling operation specified in the Contract Documents with a tabulation of the numbers and sizes of trees included in the lump sum bid. The total of the individual units shall equal the lump sum price bid. In the event of a change in the number of trees included under this item, payment will be adjusted on the basis of the Contractor's breakdown of the lump sum bid.

The size designation, under which each selective tree felling operation is performed will be determined in conformance with the following schedule of pay sizes. The caliper of a tree shall be diameter at breast height measured 4½ feet above the ground.

<b>TREE SIZE DESIGNATION</b>	
<b>TREE CALIPER IN INCHES (millimeters)</b>	<b>PAY SIZE IN INCHES (millimeters)</b>
under 10 (250)	6 (150)
10+ to 18 (250+ to 460)	14 (350)
18+ to 26 (460+ to 650)	22 (550)
26+ to 34 (650+ to 850)	30 (750)
34+ to 42 (850+ to 1050)	38 (950)
42+ to 46 (1050+ to 1150)	44 (1100)
over 46+ (1150+)	50 (1250)

The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.