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About Section 13 - Highway Seeding Section 13 of MSA-GS-05.0 is intended to assist seeding contractors who must conform to Maryland State Highway Administration (SHA) requirements for landscape seeding projects. The most recent print edition of Maryland Department of Transportation SHA "Standard Specifications for Construction and Materials", also known as the 'SHA Blue Book' was released in Jan, 2001.

Since that time, SHA has published many of its business standards and specifications on the internet, and has also published summaries of pertinent laws and provided links to several non-SHA publications and standards at <http://www.sha.state.md.us/businesswithsha/bizStdsSpecs.asp?id=B157+B159> .

The entire contents of the 2001 SHA Blue Book are available to internet users in Adobe Acrobat (.pdf) format at <http://www.sha.state.md.us/businesswithsha/bizStdsSpecs/desManualStdPub/publicationsonline/ohd/Start.pdf>

In consideration of these resources, Section 13 of MSA-GS-05.0 has been assembled for users of the SHA Blue Book with selected extracts from that reference and information which is not currently available online. The information presented here was provided by representatives of the Maryland State Highway Administration and edited to conform to the style and layout of MSA-GS-05.0.

The Maryland Seeding Association provides Section 13 as a public service for the benefit of its members and disclaims responsibility for any inaccuracies or errors it may contain. All users of MSA-GS-05.0 are cautioned to obtain copies of current SHA specifications and standards directly from the Maryland State Highway Administration Landscape Operations Division at 1-800-446-5962.

Section 701 - Topsoil and Subsoil

701.01 Description. This work shall consist of salvaging topsoil and subsoil, placing salvaged topsoil and subsoil, and placing furnished topsoil and subsoil as specified in the Contract Documents or as directed by the Engineer.

701.02 Materials. Salvaged Topsoil 920.01.01 Furnished Topsoil 920.01.02 Salvaged Subsoil 920.01.03
Furnished Subsoil 920.01.04 Agricultural Limestone 920.02 Misc. Landscaping Items 920.08

701.03 Construction. When soil or weather conditions are unsuitable, the Contractor shall cease topsoil and subsoil operations until directed by the Engineer to resume.

701.03.01 Salvaging Topsoil and Subsoil.

(a) Evaluation. Topsoil and subsoil infested with any parts (seed, rhizomes, stolons, roots, etc.) of Johnsongrass, Canada Thistle, or Phragmites will be evaluated by the Administration prior to the salvaging operations to determine the severity of the infestation. The evaluation will determine how the topsoil and subsoil are to be used and to establish a means of preventing the spread of these weeds.

(b) Removal. Topsoil and subsoil shall be removed from selected areas specified in the Contract Documents or as directed by the Engineer. Prior to removing topsoil and subsoil, the Contractor shall mow or remove all vegetation over the areas where topsoil and subsoil are to be salvaged. Topsoil and subsoil shall be removed to the depth as directed by the Engineer. The topsoil and subsoil shall be transported and stockpiled in separate storage piles and kept separated from other materials.

(c) Storage. Storage areas for topsoil and subsoil shall be constructed on well drained land, away from live streams, and in conformance with Section 308. Prior to placing piles, the Contractor shall install silt fence around the perimeter of the stockpile area and maintain the silt fence until vegetation is established. Topsoil and subsoil shall be kept in neat and separate piles separated from other excavated material. The piles shall be seeded with temporary seed immediately after final shaping of the pile. Temporary seeding shall conform to Section 704.

(d) Excess. Excess topsoil and subsoil will become the property of the Administration and any removal will require written approval from the Engineer.

701.03.02 Placing Salvaged Topsoil and Subsoil.

(a) Evaluation. The Administration will reevaluate salvaged topsoil and subsoil infested with any parts (seed, rhizomes, stolons, roots, etc.) of Johnsongrass, Canada Thistle, or Phragmites prior to placing, to establish a means of preventing the spread of these noxious weeds.

(b) Surface Preparation. The Contractor shall completely prepare and finish the surface of all areas to be covered with topsoil and subsoil 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 from stones or other foreign material 3 in. or greater. When topsoil is placed on a prepared surface material that blends with the topsoil or subsoil, the Contractor shall work the topsoil or subsoil into that material by means acceptable to the Engineer. When topsoil or subsoil will not blend with the prepared surface material, the Contractor shall roughen the surface to provide a bond for the topsoil or subsoil.

(c) Loading and Hauling. Prior to the start of the hauling operations, all grass, weeds, brush, stumps, and other objectionable material shall be removed from the surface of stockpiles.

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

(e) Placing, Spreading, and Compacting Subsoil. Subsoil shall be placed, spread, and compacted in maximum layers of 8 in. to produce a uniform firm layer of subsoil. The completed work shall be in conformance with the thickness, lines, grades, and elevations specified in the Contract Documents. Stones and other foreign material larger than 4 in. shall be removed and disposed of by the Contractor. Slopes 4:1 to 2:1 shall be tracked with cleated tract type equipment operating perpendicular to the slope.

701.03.03 Placing Furnished Topsoil and Subsoil. Refer to 701.03.02 and the following:

(a) Contractor Responsibility. The Contractor shall make all arrangements and assume all responsibility for consents, agreements, and payments with property owners involved in topsoil and subsoil operations.

(b) Administration's Soil Test Reports. Limestone and soil amendments shall be added as specified in the Administration's soil test reports and 705.03.01(d) or 705.03.02(b).

(c) Storage. If the material is stockpiled upon delivery for future use on the project, the stockpiling shall conform to 701.03.01(c).

701.04 Measurement and Payment. The payment will be full compensation for the preparation of surfaces, loading, hauling, placing, supplying, and spreading limestone and soil amendments, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

701.04.01 Salvaged topsoil will not be measured but the cost will be incidental to the Contract price for Class I Excavation.

701.04.02 Salvaged subsoil will not be measured but the cost will be incidental to the Contract price for Class 1 Excavation.

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

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

701.04.05 Placing Salvaged Subsoil will be measured and paid for at the Contract unit price per cubic yard.

701.04.06 Placing Furnished Topsoil will be measured and paid for at the Contract unit price per square yard for the depth specified.

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

701.04.08 Placing Furnished Subsoil will be measured and paid for at the Contract unit price per cubic yard.

Section 704 - Temporary Seeding and Temporary Wood Cellulose Mulching

704.01 Description. This work shall consist of furnishing and placing fertilizer, temporary seed, mulch and wood cellulose fiber on cuts, fills, and other soil 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 Seed 920.04.01 and 920.04.02 Wood Cellulose Fiber 920.05.04
Mulch 920.05.03 Water 920.08.01

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

704.03.01 Temporary Seeding. Temporary seeding shall consist of preparing soil, seeding, fertilizing, mulching and applying wood cellulose fiber binder. Temporary seeding shall be done to areas that will remain undisturbed for one month or more.

(a) Soil Preparation. Soil shall be loosened from the grading operation. Compacted soil surfaces 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.

(c) Application Rates.

<u>Temporary Seeding Materials</u>	<u>Lb. per 1000 Ft²</u>	<u>Lb. per Acre</u>
Temporary Seed Mix	2.9	125
Fertilizer (10-20-10)	17.2	750
Mulch (Straw or Hay)	91.8	4000
Wood Cellulose Fiber (Mulch Binder)	17.2	750

704.03.02 Temporary Wood Cellulose Mulching. Temporary wood cellulose mulching shall consist of applying wood cellulose fiber to those areas that will be disturbed in less than one month.

(a) Soil Preparation. Soil shall be left in the condition from the grading operation.

(b) Mulching. Wood cellulose fiber shall be mixed with water in a hydroseeder and applied uniformly. Temporary wood cellulose mulching shall consist of wood cellulose fiber applied at the rate of 34.4 to 45.8 lb per 1000 ft² or 1500 to 2000 lb per acre.

704.04 Measurement and Payment. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. Repairs due to the Contractor's negligence as determined by the Engineer shall be done at no additional expense to the Administration. After acceptance, mulch requiring replacement, as directed by the Engineer, will be paid for as additional work.

704.04.01 Temporary Seeding will be measured and paid for at the Contract unit price per pound of seed.

704.04.02 Temporary Wood Cellulose Mulching will be measured and paid for at the Contract unit price per ton of wood cellulose fiber.

Section 705 - Turf Establishment

705.01 Description. This work shall consist of soil preparation, seeding, fertilizing, liming, mulching, overseeding, refertilization, and mowing all areas designated for turf establishment as specified in the Contract Documents or as directed by the Engineer. Liming and fertilizing rates will be determined by the Nutrient Management Plan.

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 2 - Washington (East of Clear Spring, MD), Frederick, Carroll, Baltimore, Harford, Cecil, Howard, Montgomery, and Baltimore City

Region 3 - Anne Arundel, Prince George's, Calvert, Charles, St. Mary's, Kent, Queen Anne's, Talbot, Caroline, Dorchester, Wicomico, Worcester and Somerset

705.01.02 Seeding Seasons and Seed Mixes.

Seasons	Spring and Fall	Summer	Late Fall
	Month/Day	Month/Day	Month/Day
Regions		Permanent Seed Mix	
1	4/1 to 6/15 and 8/1 to 10/1	6/16 to 7/31	10/2 to 11/1
2	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
1, 2, and 3	No Additives	Plus Additive A	Plus Additive B
	Plus Additive C for seeding a. Areas 30 ft and greater from edge of pavement		b. Slopes 4:1 and steeper
Additives	A = Lovegrass or Foxtail Millet	B = Temporary Seed Mix	C = Sericea Lespedeza

Note: The Administration will supply substitute seed for Lovegrass, Foxtail Millet, and Sericea Lespedeza when seeding within 4 miles of a state airport.

Maryland SHA Jan. 2004 Seed and Seed Mix Specifications

SHA Permanent Seed Mix*

%	Species	Purity Not Less Than	Weed Seed Not More Than	Min. Germ. Including Hard Seed	Seed Not to Exceed
90%	Certified Tall Fescue	98%	0.5%	90%	None

Kentucky 31 alone or a mixture. The mixture shall consist any two or more of the following cultivars with no less than 30% of any one cultivar: Apache II, Arid 3, Barerra, Barlexus, Bonsai 2000, Bravo, Chapel Hill, Coyote, Crewcut II, Crossfire II, Duster, Dynasty, Empress, Endeavor, Falcon II, Finelawn Petite, Genesis, Good-En, Grande, Hounddog 5, Jaguar 3, Laramie, Leprechaun, Lion, Masterpiece, Millennium, Mustang II, Mustang 3 Olympic Gold, Pedestal, Picasso, Pixie E+, Plantation, Rebel 2000, Rebel Exeda, Rebel Jr., Rebel Sentry, Redcoat, Rembrandt, Renegade, Reserve, Shenandoah, Shenandoah II, Southern Choice, SR 8300, Stetson, Tarheel, Tarheel II, TF 66, Titan 2, Tulsa, Virtue, Watchdog, Wpeze, Wolfpack, or Wyatt.

5%	Certified Kentucky Bluegrass	90%	0.4%	80%	None
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Any of the following cultivars: Absolute, Allure, Apollo, Arcadia, Award, Baron, Baronie, Blacksburg, Blackstone, Bluechip, Brilliant, Caliber, Challenger, Champagne, Chateau, Coventry, Eagleton, Envicta, Fairfax, Goldrush, Impact, Jefferson, Kenblue, Liberator, Limousine, Livingston, Marquis, Midnight, Moonlight, Nuglade, Odyssey, Quantum Leap, Princeton 105, Rambo, Rugby II, Serene, Shamrock, Total Eclipse, Unique, or Washington.

5%	Certified Perennial Ryegrass	97%	0.4%	90%	None
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Any of the following cultivars: Accent, Admire, Affinity, Affirmed, All Star 2, Amazing, Applaud, Arrival, Ascend, Barlennium, Blazer IV, Brightstar, Brightstar II, Brightstar SLT, Buccaneer, Caddy Shack, Calypso II, Catalina, Catalina II, Charismatic, Churchill, Citation Fore, Courage, Cutter, Divine, Elf, Elfkin, Exacta, Extreme, Fiesta 3, Grand Slam, Head Start, Imagine, Inspire, IQ, Kokomo, Laredo, Mach1, Majesty, Manhattan 3, Manhattan 4, Omega 3, Pacesetter, Palmer III, Panther, Passport, Pennant II, Pentium, Pizzazz, Pleasure XL, Prelude III, Premier II, Prizm, Prowler, Quickstart, Racer, Salinas, Secretariat, Seville II, SR 4220, SR 4350, SR 4420, SR 4500, Top Gun, UT-1000, Wind Star or Stellar.

		Temporary Seed Mix *			
		Purity	Weed	Min. Germ.	Seed
		Not Less Than	Seed Not More Than	Including Hard Seed	Not to Exceed
95%	Barley or Rye	98%	0.1%	85%	None
5%	Foxtail Millet	99%	0.1%	80%	None

Temporary Seed Mix also serves as a late fall additive in lieu of rye grain.

Additive Seeds*

Lehmann Lovegrass	98%	0.5%	80%	None
Foxtail Millet	90%	0.1%	80%	None
Certified Sericea	98%	0.5%	85%	20%
Lespedeza (Interstate or Interstate 76)				

Other Seed*

Crimson Clover	98%	0.5%	80%	20%
Crownvetch	98.5%	0.5%	80%	30%
Certified Fults or Salty Alkali Grass	98%	0.5%	85%	None

*Seed shall be tested, mixed and tagged under the supervision of the Turf and Seed section of the Maryland Department of Agriculture.

Tall Fescue Cultivars Acceptable for Maryland Certified Sod Production & SHA Mixtures

Developed January 14, 2004, Updated March 31, 2004

S.H.A. Mix #	Cultivar	Recommend	Promisin g	S.H.A. MIX#	Cultivar	Recommend	Promising
	2 ND MILLENNIUM		X	1,Pr	DYNASTY	X	
1,Pr	APACHE II	X ^(3,4)		1,Pr	EMPRESS	X ^(3,4)	
1,Pr	ARID 3	X ⁽⁴⁾		1,Pr	ENDEAVOR	X	
	AVENGER		X	1,Pr	FALCON II	X	
1,Pr	BARERRA	X			FALCON IV		X
1,Pr	BARLEXAS	X			FINELAWN ELITE		X
	BARRINGTON		X	1,Pr	FINELAWN	X ^(3,4)	
	BILTMORE		X		PETITE		
	BINGO	X			FIVE POINT		X
	BLACKWATCH		X		FOCUS		X
1,Pr	BONSAI 2000	X ⁽⁴⁾		1,Pr	FORTE		X
1,Pr	BRAVO	X			GENESIS	X ⁽⁴⁾	
	CAYENNE		X	1,Pr	GLENEAGLE		X
1,Pr	CHAPEL HILL	X ⁽⁴⁾		1,Pr	GOOD-EN	X	
	COCHISE III		X		GRANDE	X	
	CONSTITUTION		X		GRANDE II		X
1,Pr	COYOTE	X		1,Pr	GREMLIN		X
1,Pr	CREWCUT II	X			HOUNDOG 5	X	
1,Pr	CROSSFIRE II	X		1,Pr	INFERNO		X
	DAVINCI		X		JAGUAR 3	X	
	DAYTONA		X		JUSTICE		X
	DOMINION	X		1,Pr	KALAHARI		X
	DURANA	X ⁽⁴⁾			KENTUCKY 31		
1,Pr	DUSTER	X		1,Pr	KITTY HAWK 2000		X
					LARAMIE	X	

Tall Fescue Cultivars are continued on the next page...

Tall Fescue Cultivars ...continued from table above

S.H.A. Mix #	Cultivar	Recommend	Promising	S.H.A. MIX#	Cultivar	Recommend	Promising
1,Pr	LION	X ⁽⁴⁾		1,PR	SHENANDOAH II	X ⁽⁴⁾	
	MAGELLAN		X		SILVERADO II		X
1,Pr	MASTERPIECE	X			SILVERSTAR		X
	MATADOR		X		SOUTH PAW		X
1,Pr	MILLENNIUM	X		1,Pr	SOUTHERN CHOICE	X ⁽⁴⁾	
1,Pr	MUSTANG II	X ^(3,4)			SOUTHERN CHOICE II		X
1,Pr	MUSTANG 3	X			SR-8250		X
	NINJA 2		X	1,Pr	SR-8300	X	
1,Pr	OLYMPIC GOLD	X			SR8500		X
	ONYX	X			SR8550		X
	PADRE		X		SR-8600		X
1,Pr	PICASSO	X		1,Pr	STETSON	X	
1,Pr	PLANTATION	X		1,Pr	TARHEEL	X	
	PURE GOLD		X	1,Pr	TARHEEL II		X
	QUEST		X		TEMPEST		X
	RAPTOR		X	1,Pr	TF 66	X	
1,Pr	REBEL 2000	X ⁽⁴⁾		1,Pr	TITAN 2	X ⁽⁴⁾	
1,Pr	REBEL EXEDA	X			TITAN LTD.		X
1,Pr	REBEL JR.	X ⁽³⁾			TITANIUM		X
1,Pr	REBEL SENTRY	X			TOMAHAWK RT		X
1,Pr	RED COAT	X ⁽⁴⁾		1,Pr	TULSA	X ⁽⁴⁾	
1,PR	REMBRANDT	X			TULSA II		X
	RENDITION		X		TURBO		X
1,Pr	RENEGADE	X ⁽⁴⁾		1,Pr	VIRTUE	X	
1,Pr	RESERVE	X ⁽⁴⁾		1,Pr	WATCHDOG	X	
	RIVERSIDE		X	1,Pr	WOLFPACK	X	
	SCORPION		X	1,Pr	WPEZE	X	
1,PR	SHENANDOAH	X ⁽⁴⁾		1,Pr	WYATT	X	

Notes Regarding Tall Fescue Varieties, Continued from Table Above

- ⁽¹⁾ Indicates varieties to be considered for removal in 2005 due to declining performance relative to other varieties.
⁽²⁾ Indicates varieties to be considered for removal in 2005 due to declining seed quality.
⁽³⁾ Indicates varieties to be considered for removal in 2005 due to no recent testing of certified seed in MD or VA.
⁽⁴⁾ Indicates varieties to be considered for removal due to lack of current testing. Must be included in next available test.

Maryland Certified Sod Mixtures, Note:

1. Tall Fescue must be 90-100% of the mixture.
2. Cultivars may be seeded individually or as blends. If seeded individually, must be tested & approved by MDA/T&S.
3. Promising cultivars, while performing well, may not have been tested for three years in Md. & Va. or may be limited in seed availability.
4. See listing of Kentucky bluegrass cultivars eligible for mixing with tall fescue at a rate of 0-10%.

Maryland State Highway Administration Mixes, SHA #1 and SHA Permanent Mixtures:

Kentucky 31 alone or in a mixture.
Mixture of tall fescues must contain two or more cultivars.
Mixture must contain 30% of any one cultivar.

Note: SHA #1 Mixture (85% Tall Fescue, 10% Kentucky Bluegrass, 5% Perennial Ryegrass) seeded at 100 lbs/acre is being phased out and being replaced with SHA Permanent Mixture (90% Tall Fescue, 5% Kentucky Bluegrass, 5% Perennial Ryegrass) Seeded at 150 lbs/acre. Watch for more information on timing and change over from the MD State Highway Administration (SHA).

Perennial Ryegrass Cultivars Acceptable for Maryland Certified Seed Mixtures & S.H.A. Mixtures

Developed January 14, 2004, Updated March 31, 2004

S.H.A. Mix #	Cultivar	Recommend	Promising	S.H.A. MIX#	Cultivar	Recommend	Promising
1,Pr	ACCENT	X ⁽⁴⁾		1,Pr	CRUISER		X
1,Pr	ADMIRE		X	1,Pr	CUTTER	X ⁽⁴⁾	
1,Pr	AFFINITY			1,Pr	DIVINE	X	
1,Pr	AFFIRMED	X		1,Pr	ELF		
1,Pr	ALL STAR 2		X	1,Pr	ELFKIN		X
1,Pr	AMAZING		X	1,Pr	EXACTA	X	
1,Pr	APPLAUD	X		1,Pr	EXTREME	X	
1,Pr	ARRIVAL		X	1,Pr	FIESTA 3	X	
1,Pr	ASCEND		X	1,Pr	GALLERY	X	
1,Pr	BARLENNIUM		X	1,Pr	GATOR 3		X
1,Pr	BLAZER IV	X		1,Pr	GRAND SLAM		X
1,Pr	BRIGHTSTAR	X ⁽⁴⁾		1,Pr	HEADSTART	X ⁽³⁾	
1,Pr	BRIGHTSTAR II	X			ICON		X
1,Pr	BRIGHTSTAR SLT		X	1,Pr	IMAGINE	X ^(3,4)	
1,Pr	BUCCANEER			1,Pr	INSPIRE	X	
1,Pr	CABO		X	1,Pr	IQ		X
1,Pr	CADDIE SHACK	X ⁽⁴⁾			JET		X
1,Pr	CALYPSO II	X		1,Pr	KOKOMO		X
1,Pr	CATALINA			1,Pr	LAREDO	X ⁽²⁾	
1,Pr	CATALINA II		X	1,Pr	MACH1	X	
	CATHEDRAL II		X	1,Pr	MAJESTY	X	
1,Pr	CHARISMATIC	X		1,Pr	MANHATTAN 3		
1,Pr	CHURCHILL	X		1,Pr	MANHATTAN 4	X	
1,Pr	CITATION FORE		X		MONTEREY II	X	
1,Pr	COURAGE		X		NEXUS	X	

Perennial Ryegrass Cultivars ...continued from table above

S.H.A. Mix #	Cultivar	Recommend	Promising	S.H.A. MIX#	Cultivar	Recommend	Promising
1,Pr	OMEGA 3	X ⁽⁴⁾		1,Pr	RACER II	X	
1,Pr	PACESETTER		X		RADIANT		X
1,Pr	PALMER III				RENAISSANCE		X
1,Pr	PANTHER			1,Pr	SALINAS		X
1,Pr	PASSPORT		X	1,Pr	SECRETARIAT		
1,Pr	PENNANT II			1,Pr	SEVILLE II		X
1,Pr	PENTIUM		X		SPLENDID		X
	PINNACLE II		X	1,Pr	SR 4220		X
1,Pr	PIZZAZZ	X		1,Pr	SR4350		X
1,Pr	PLEASURE XL		X	1,Pr	SR 4420		X
1,Pr	PRELUDE III	X ^(3,4)		1,Pr	SR 4500		X
1,Pr	PREMIER II	X ^(2,3)		1,Pr	STELLAR	X	
1,Pr	PRIZM	X ⁽⁴⁾			SUNKISSED		X
1,Pr	PROWLER	X			TERRADYNE		X
	QUEST II		X	1,Pr	TOP GUN	X ⁽⁴⁾	
1,Pr	QUICKSTART	X ⁽⁴⁾			WILMINGTON		X
	RACER		X	1,Pr	WIND STAR	X ⁽⁴⁾	

^(1,Pr) Indicates varieties to be considered for removal in 2005 due to **declining performance relative to other varieties.**⁽²⁾ Indicates varieties to be considered for removal in 2005 due to **declining seed quality.**⁽³⁾ Indicates varieties to be considered for removal in 2005 due to **no recent testing of certified seed in MD or VA.**⁽⁴⁾ Indicates varieties to be considered for removal due to lack of **current testing in specific category.** Must be included in next available test. Note: 1, Pr. Perennial ryegrass must be 5% of the mixture by weight.

Kentucky Bluegrass Cultivars Acceptable for Maryland Certified Sod Production & S.H.A. Mixtures

Developed January 14, 2004, Updated March 31, 2004

S.H.A Mix #	Cultivar	Category	Use with Tall Fescue	S.H.A Mix #	Cultivar	Category	Use with Tall Fescue
1,3,Pr	ABSOLUTE ⁽⁴⁾	G	X	1,3,Pr	CHALLENGER ⁽⁴⁾	G	X
1,3,Pr	ALLURE	P	X	1,3,Pr	CHAMPAGNE	G,S	X
1,3,Pr	APOLLO	G	X		CHAMPLAIN	G	X
1,3,Pr	ARCADIA	G	X	1,3,Pr	CHATEAU	G,S	X
	ASCOT	P,S	X		CHELSEA	P	X
1,3,Pr	AWARD	G	X		CHICAGO II	P	X
	AWESOME	G	X	1,3,Pr	COVENTRY	G,S	X
1,3,Pr	BARON	L	X		DIVA	P	X
1,3,Pr	BARONIE	G	X	1,3,Pr	ENVICTA	G	X
	BARIRIS	P,L	X		EVEREST	P	X
	BARRISTER	P	X		EVERGLADE	P	X
	BEDAZZLED	P	X		EXCURSION	G	X
	BEYOND	G	X	1,3,Pr	FAIRFAX	G	X
1,3,Pr	BLACKSBURG ⁽⁴⁾	G	X		GINNEY	P	X
1,3,Pr	BLACKSTONE	G	X	1,3,Pr	GOLDRUSH	G	X
1,3,Pr	BLUECHIP ⁽⁴⁾	G	X	1,3,Pr	IMPACT	G	X
	BLUEMAX	P	X	1,3,Pr	JEFFERSON	G	X
	BLUESTONE	P	X		JULIUS	P	X
	BLUE VELVET	P	X	1,3,Pr	KENBLUE		
	BORDEAUX	G	X		LANGARA	P	X
1,3,Pr	BRILLIANT	G,S	X	1,3,Pr	LIBERATOR	G,S	X
1,3,Pr	CALIBER ⁽⁴⁾	G,L	X	1,3,Pr	LIMOUSINE	G	X

Kentucky Bluegrass Cultivars ...continued from table above

S.H.A Mix #	Cultivar	Category	Use with Tall Fescue	S.H.A Mix #	Cultivar	Category	Use with Tall Fescue
1,3,Pr	LIVINGSTON ⁽⁴⁾	G,L	X	1,3,Pr	RAMBO	G	X
1,3,Pr	MARQUIS	G	X		RAVEN	G	X
	MERCURY	P	X		ROYCE	P	X
1,3,Pr	MIDNIGHT	G,L	X	1,3,Pr	RUGBY II	G	X
	MIDNIGHT II	P	X	1,3,Pr	SERENE	G	X
1,3,Pr	MOONLIGHT	G,S	X	1,3,Pr	SHAMROCK	G	X
	MOONSHADOW	P	X		SHOWCASE	P,S	X
	NORTH STAR	G	X		SR 2284	P	X
	NOTTINGHAM		X ⁽⁴⁾	1,3,Pr	TOTAL ECLIPSE	G	X
	NUDESTINY	P	X		TSUNAMI	P	X
1,3,Pr	NUGLADE	G,S	X		VOYAGER II	P	X
	PERFECTION	P	X	1,3,Pr	WASHINGTON	G,L	X
1,3,Pr	PRINCETON 105	G,S	X		WILDWOOD		X
1,3,Pr	QUANTUM LEAP	G,S	X				

⁽¹⁾ Indicates varieties to be considered for removal in 2005 due to **declining performance relative to other varieties.**⁽²⁾ Indicates varieties to be considered for removal in 2005 due to **declining seed quality.**⁽³⁾ Indicates varieties to be considered for removal in 2005 due to **no recent testing of certified seed in MD or VA**⁽⁴⁾ Indicates varieties to be considered for removal due to lack of **current testing in specific category.** Must be included in next avail. test.**Category Codes:****G** = Recommended variety for General Use.**P** = Promising variety for General Use but insufficient data or seed availability to recommend fully.**S** = Variety performs well in Shade tests**L** = Variety performs well in Low Maintenance tests**Kentucky bluegrass variety selection requirements for Maryland Certified Sod Production, Notes:**

1. No one variety may be more than 35%, by weight, of the mixture.
2. Each variety must be 10%, by weight, of the mixture except when mixed with tall fescue.
3. Promising varieties may not compose more than 35%, by weight, of the total mixture.
4. Varieties mixed with tall fescue may not compose more than 10%, by weight, of the total mixture.

Requirements for Maryland State Highway Administration Mixtures (SHA), Note:

1. SHA Mixture #1 requires 10% of the mixture to be composed of any one or more of the indicated varieties.
2. SHA Mixture #3 requires 5% of the mixture to be composed of any one of the indicated varieties.
3. SHA Permanent Mixture requires 5% of the mixture to be composed of any one of the indicated varieties.

705.02 Materials.

Mulch Binder	920.05.04
Agricultural Limestone	920.02
Fertilizer	920.03.01
Seed	920.04.01 and .02
Mulch	920.05.03 and .04
Miscellaneous	920.08

705.02.01 Soil Sampling and Testing. Soil sampling and testing shall be completed in conformance with MSMT 356. The soil shall be tested for pH, organic matter, a grading analysis, USDA textural analysis, phosphorus, and potassium. The procedure is also used by the Landscape Operations Division (LOD) to develop a Nutrient Management Plan (NMP) for permanent seeding and sodding.

705.03 Construction Seeding shall be performed when the temperature is above 32 F and the ground is not frozen.

705.03.01 Permanent Seeding. Seeding shall consist of soil preparation, liming, seeding, fertilizing, and applying and securing 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 gullies, washes, or disturbed areas that develop subsequent to final dressing shall be repaired prior to seeding. Topsoiled and nontopsoiled areas shall be loosened by discing, harrowing, raking, or by other approved methods immediately prior to seeding, unless otherwise directed by the Engineer at the following depths.

(1) Topsoil Areas 4 In. and Greater. The topsoil shall be loosened to a depth of 3 in.

(2) Topsoil Areas 2 In. The topsoil shall be loosened to a depth of 2 in.

(3) Nontopsoiled Areas. The subsoil shall be loosened to a depth of 1 in.

The area shall be free of all clods, stones, and other foreign materials larger than 3 in. On and adjacent to commercial and residential properties, the size of stones and other foreign material shall not be larger than 1-1/2 in. To conserve moisture, a cultipacker may be run over the seedbed before or after seeding, but before mulching.

On areas flatter than 4:1, the final seedbed shall be prepared so there is an even and uniform surface; all bulldozer cleat marks shall be removed. Slopes 4:1 and steeper excluding serrated cut slopes shall be tracked as specified in 701.03.02(d).

Serrated Cut Slopes shall not be loosened. The areas shall be seeded and mulched in 50 ft. maximum 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 and be equipped with an agitation system capable of keeping all the solids in a state of suspension. The mixture shall be directed so the droplets produce a uniform spray to avoid erosion or runoff. Mechanical seeders shall be capable of placing seed at the specified rate. Use of hydroseeders and spinner spreaders is prohibited during windy periods when the materials could land on sensitive areas or on sensitive structures.

(c) Application Rates.

Material	Lb per Acre
Agricultural Limestone Salvaged Topsoil Areas, Furnished Topsoil Areas, Nontopsoiled Areas and Serrated Cut Slopes	Specified in Nutrient Management Plan
(a) Regions 1 and 2 Limestone	Up to 8700
(b) Region 3 Dolomitic Limestone	Up to 8050
Seed Permanent Seed Mix Areas that are:	150
(a) Less than 30 ft from the pavement edge and are flatter than 4:1	
(b) At facilities	
Seed Permanent Seed Mix Sericea Lespedeza Areas that are:	100
(a) 30 ft and greater from the edge of the pavement and/or	20
(b) 4:1 and steeper	
Seed Temporary Seed Mix	25
Lovegrass	2
Foxtail Millet	10
Fertilizer at Seeding	Specified in Nutrient Management Plan
Topsoiled Areas	
10-22-22 (50% ureaform nitrogen)	Up to 1000
38-0-0 (ureaform)	Up to 130
0-0-60	Up to 180
Nontopsoiled Areas	
10-22-22 (50% ureaform nitrogen)	Up to 1000
38-0-0 (ureaform)	Up to 250
0-0-60	Up to 200
Refertilizing	
Topsoiled Areas	
5-20-20	100
38-0-0 (ureaform)	400
Nontopsoiled Areas	
5-20-20	400
38-0-0 (ureaform)	600
Mulch	
(a) Straw or Hay	
(1) Secured with Wood Cellulose Fiber	4000
(2) Secured with Mulch Anchoring Tool	5000
(3) Secured with the Tracking Method	3000
(b) Wood Cellulose Fiber	1500
Mulch Binder	
Wood Cellulose Fiber	750

(d) Liming. Agricultural limestone where required on topsoiled areas flatter than 4:1, shall be incorporated into the topsoil before seed and fertilizer are applied at the following depths:

(1) 4 in. of Topsoil and Greater. The limestone shall be incorporated to a depth of 3 in.

(2) 2 in. of Topsoil. The limestone shall be incorporated to a depth of 2 in.

Agricultural limestone where required on all areas 4:1 and steeper, will not require incorporation and may be mixed with the seed and fertilizer prior to permanent seeding.

(e) Seeding and 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. When seed is sown with mechanical seeders, seed and fertilizer shall be incorporated to a depth not more than 1/4 in. 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 sown 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 sown 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 1/2 to 2 in. At least 95 percent of the mulch shall be 6 in. or more in length. Mulch applied by hand shall provide a loose depth of 1-1/2 - 3 in.

(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 areas flatter than 4:1 and all median areas on highways under traffic. Mulch shall be incorporated into the soil to a minimum depth of 2 in.

(2) Tracking Method. The mulch shall be incorporated into the soil with track type equipment having steel cleats with a minimum depth of 1-1/2 in. 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 mulch binding method in 705.03.01(g)(3).

(3) Mulch Binding Method. Mulch binder material shall be uniformly applied without displacing the mulch.

705.03.02 Nontopsoiled Areas. All nontopsoiled areas to be seeded shall have limestone and 38-0-0 (UF) fertilizer applied.

705.03.03 Overseeding. Overseeding permanent seeding 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 be as directed by the Engineer and conform to 705.03.01 and .02. Soil preparation and mulch will not be required.

705.03.04 Refertilizing. Refertilizing shall consist of applying 5-20-20 and 38-0-0 (UF) fertilizer to topsoiled, nontopsoiled and serrated cut slope areas, and other areas as directed by the Engineer as follows:

Areas	Regions	Number of Applications	Months/Weeks After Seeding
Topsoiled	1 and 2	1	4 to 6 weeks
Nontopsoiled and serrated cut slopes	1 and 2	1	April or September
	3	2	April and September

705.03.05 Tractor Mowing Mowing shall consist of using a minimum 5 ft flail or rotary tractor mower as directed by the Engineer, and shall conform to the Administration's Mowing Guidelines. The vegetation shall be cut to 5 in. high before it reaches 20 in. high.

705.03.06 Hand Mowing Mowing shall consist of using a minimum 19 in. hand mower as directed by the Engineer. Vegetation shall be cut to 3 to 4 in. high before it reaches 15 in. high.

705.03.07 Repairing Damaged 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 as deemed by the Engineer at no additional cost to the Administration. 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 are in conformance.

705.04 Measurement and Payment Turf establishment will be measured and paid for at the Contract unit price for the items 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 Permanent Seeding Areas per square yard. This item includes preparing soil and seed bed, applying seed (mixes and additives), fertilizers outlined in the Nutrient Management Plan, and mulch.

705.04.02 Liming Salvaged Topsoil and Nontopsoiled Areas per ton.

705.04.03 Fertilizing Nontopsoiled Areas with 38-0-0 (ureaform) fertilizer per pound.

705.04.04 Overseeding Permanent Seeding Areas per pound of seed.

705.04.05 Refertilizing Topsoiled Areas per pound for the combined weight per pound of 5-20-20 and 38-0-0 (ureaform) fertilizers.

705.04.06 Refertilizing Nontopsoiled Areas per pound for the combined weight per pound of 5-20-20 and 38-0-0 (ureaform) fertilizers.

705.04.07 Mowing per hour. This item includes tractor and hand mowing.

705.04.08 Repairing Damaged Areas Once the seeding and mulching has been completed, no additional work at the Contractor's expense will be required, Subsequent repairs and replacements shall be made by the Contractor and will be paid for as additional work, except when the Engineer determines that the defect or damage is due to the Contractor's negligence.

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

706.03 Construction. Refer to 705.03.

706.03.01 Seeding. Seeding shall consist of soil preparation, liming, seeding, fertilizer and applying and securing mulch in conformance with 705.03.01 with the following exceptions:

(a) **Cover Companion Seed Mix.** The contractor shall provide the cover companion seed mix.

(b) **Woody Seed Mix.** The Administration will provide the woody seed mix.

(c) **Application Rates.**

<u>Materials</u>	<u>Lb per Acre</u>
Agricultural Limestone	Refer to 705.03.01(c)
Woody Shrub Mix	50
Cover Companion Mix	35
Lovegrass or	2
Foxtail Millet	10
Rye Grain	22
Fertilizer:	
5-20-20	1000
38-0-0 (UF)	650
Refertilizing:	
0-20-20	400
38-0-0 (UF)	650
Mulch	5000
Mulch Binder	
Wood Cellulose Fiber	750

706.03.02 Nontopsoiled Areas. Refer to 705.03.03.

706.03.03 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 (Refer to 705.01.01 for Regional Areas):

<u>Regions</u>	<u>Number of Applications</u>	<u>Months after Seeding</u>
1 and 2	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 for 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. Administration furnished woody shrub seed mix, the Contractor furnished companion 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. Water 920.08.01 Herbicide 920.08.07 Marking Dye 920.08.08 Wildflower Seed Mix and Companion Seed Mix Furnished by the Administration

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: Refer to 705.01.01 for Regional Areas.

<u>Regions</u>	<u>Seeding Dates</u>
1	Sept. 1 to May 1
2	Oct. 1 to April 15
3	Oct. 15 to April 15

707.03.02 Pesticide Application. All pesticide applications shall be as specified in the Maryland Pesticide Applicator's Law and in conformance with the manufacturer's recommendations. All pesticide applications shall be performed under the supervision of a Certified Applicator of Pesticides (Category III A or VI).

Herbicide. All vegetation in the seeding area shall be eradicated prior to seeding by use of a herbicide. The herbicide shall be glyphosate with a wetting agent mixed with water and a water soluble marking dye, applied at the following rates:

Herbicide — 5 lb per acre of active ingredient

Marking Dye — 6 to 15 oz per acre

Water — 40 to 50 gal per acre

Reports. 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 area to be seeded shall be mowed to a maximum height of 1 in. 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. 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) Methods.

(1) **Drill Seeding.** Seed shall be premixed and placed in the seed boxes A, B, and C as noted in (d). Seed mix shall be drilled through the dead turf and thatch into the soil to a depth of 1/4 in.

(2) **Broadcast Seeding.** All seed listed in (d) for boxes A, B, and C shall be combined and uniformly mixed with calcine clay carrier (cat litter). Seed mix shall be spread in a crisscross pattern. After spreading the mixture shall be lightly raked or dragged to a maximum depth of 1/8 in.

(d) Mixes and Seeding Rates.

Box A - Wildflower and Companion Seed

<u>Material</u>	<u>Lb. per Acre</u>	<u>Material</u>	<u>Lb. per Acre</u>
Spurred Snapdragon	0.50	Plains Coreopsis	1.00
Corn Poppy	1.00	Black Eyed Susan	1.00
Scarlet Sage	0.50	Lemon Mint	0.50
Shasta Daisy	0.20	New England Aster	0.20
Siberian Wallflower	0.50	Evening Primrose	0.10
White Yarrow	0.20	California Poppy	1.00
Hard or Sheep Fescue	10.00		

Box B - Wildflower Seed

Material	Lb. per Acre	Material	Lb. per Acre
Dames Rocket	1.00	Rocket Larkspur	0.50
Tall Cornflower	1.25	Purple Coneflower	2.00
Lance-Leaf Coreopsis	1.00	Yellow Cosmos	0.25
Purple Cosmos	0.25	Sweet William	0.50
Crimson Clover	1.00		

Box C - Fluffy Wildflower Seed

Material	Lb. per Acre	Material	Lb. per Acre
Firewheel	0.20	Blanket Flower	1.00
Calendula	0.50	Sunflower Autumn Beauty	0.20

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 herbicide, marking dye, mowing, soil preparation, and seeding (excluding the cost of wildflower and companion seed) 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 Region 1.
- (b) Tall fescue sod shall be used in Regions 2 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 frozen sod is prohibited.

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 to the Administration.

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

Application Rates	Material	Lb. per Acre
	Agricultural Limestone	4000
	Fertilizer 10-10-10	900
	38-0-0 (UF)	200

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

708.03.05 Placing. Sod shall be placed with close joints and no overlapping. Cracks are prohibited 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 and have a flat surface of approximately 100 in². A roller shall weigh 40 lb/ft of width. Any slipping of sod shall be corrected by the Contractor at no additional cost to the Administration. 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 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 shall be within four hours after the sod is placed and shall wet the soil to a depth of 3 in. 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 200 lb/acre.

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. of soil. When 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 - 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. Type A Soil Stabilization Matting 920.06 Type B Soil Stabilization Matting 920.06
Staples for Type A Soil Stabilization Matting 920.06.01 Staples and Wood Stakes for Type B Soil Stabilization Matting 920.06.02 The Contractor shall select the soil stabilization matting from the prequalified list of soil stabilization matting maintained by the Office of Materials and Technology.

709.03 Construction. When topsoil is specified for areas where matting is to be placed, the work shall be completed before the soil stabilization matting operation is started. The matting shall be placed within 48 hours after seeding operations have been completed. Matting shall be laid smoothly and firmly upon the seeded surface in the direction of water flow. Stretching shall be avoided.

709.03.01 Placing and Securing Type A Soil Stabilization Matting. Where more than one width of matting is required, the strips shall overlap at least 2 in. Ends shall overlap at least 6 in. The upgrade end of each strip of matting shall be turned down and buried to a depth of not less than 6 in. 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 on 2 ft centers throughout the mat. Staples shall be placed no more than 18 in. apart in the center of the ditch and along the outside edge of the last mat installed. On all overlapping edges, staples shall be placed 18 in. apart. At all ends of the matting, staples shall be placed 6 in. apart. Mats constructed of wood and hydromulch shall also be watered immediately after stapling to bond the mat with the soil. Water shall be applied so it falls on the mat like a normal rainfall. At no time shall the water be directed from a water or a hydroseeder spray gun in a direct straight line to the mat.

709.03.02 Placing and Securing Type B Soil Stabilization Matting. Matting shall be installed to preclude a longitudinal joint. A longitudinal joint may be installed if approved by the Engineer. Matting shall be securely fastened in place with either staples or wood stakes (fasteners) driven vertically into the soil. Staples shall be driven flush with the matting and wood stakes shall be driven so 3 in. is left above the matting. Staples shall be placed on 2 ft centers throughout the mat. Staples shall be placed no more than 18 in. apart in the center of the ditch and along the outside edge of the last mat installed. On all overlapping edges, fasteners shall be placed 18 in. apart. At all ends of the matting fasteners shall be placed 6 in. apart.

709.03.03 Staple and Fastener Lengths.

<u>Types</u>	<u>Regions 1 and 2</u>	<u>Region 3</u>
	Length in. (min.)	Length in. (min.)
U Staple	12	18
T Staple	18 Main Leg 2 Secondary Leg	24 Main Leg 2 Secondary leg
Wood Stakes	12	18

709.04 Measurement and Payment. The matting will be measured and paid for at the Contract unit price for the area actually covered. If the top netting on the Type A matting degrades before the disturbed area is fully stabilized the Contractor shall replace the matting and reseed the affected area at no additional cost to the Administration. The payment will be full compensation for all matting furnished and placed, staples, fasteners, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

709.04.01 Type A Soil Stabilization Matting per square yard.

709.04.02 Type B Soil Stabilization Matting per square yard.

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

Section 920 - Landscaping

920.01 Topsoil and Subsoil.

920.01.01 Salvaged Topsoil. Salvaged topsoil shall be that surface material to be salvaged from the project which has been classified as topsoil as specified in the Contract Documents.

920.01.02 Furnished Topsoil. Furnished topsoil shall be natural, friable surface soil uniform in color and texture and not supplied from the project. Topsoil shall be free from any parts of Johnsongrass, Canada Thistle, or Phragmites. Furnished topsoil shall be obtained from a stockpile that has been constructed and initially tested by the producer. The stockpile shall be constructed so the pile is identifiable and in a homogeneous mixture. The stockpile shall be sampled by the producer at 10 locations to represent the entire quantity. The samples shall be combined and thoroughly mixed. A pint sized sample shall be obtained for testing within 6 months of the time the topsoil is needed for the project. The sample shall be submitted by the Producer/Contractor and tested by one of the following soil testing laboratories:

- (a) A&L Eastern Agricultural Laboratories
7621 Whitepine Rd.
Richmond, VA 23237
- (b) Agricultural Analytical Services Laboratory
Pennsylvania State University
University Park, PA 16802
- (c) University of Delaware
149 Townsend Hall
University of Delaware
Newark, DE 19717

The laboratory shall test for the following:

- (a) Percent sand, silt, and clay content.
- (b) pH.
- (c) Organic matter.

A copy of the soil test report shall be forwarded to the Administration at the following address:

Office of Materials & Technology
Soils & Aggregates Laboratory
2323 West Joppa Road
Lutherville, MD 21093

After the Soils & Aggregates Laboratory has reviewed the soil test report, the need for Administration testing will be determined. If approved by the Regional Engineer, a secondary sample will be obtained by the Engineer for verification testing and final recommendations. The producer shall be responsible for quality control of the stockpile to ensure that the material conforms to Specifications.

The producer's certification conforming to TC-1.02 shall accompany the first shipment each day topsoil is being supplied to the project. A copy of the certification shall be delivered to the Engineer.

Topsoil shall have an organic content between 1.5 to 10.0 percent by weight when tested as specified in T 194. Furnished topsoil shall have a corrected pH value of not less than 6.0 nor more than 7.5.

Grading analysis shall be as follows:

Sieve Size	Minimum Percent Passing by Weight
2 in.	100
No. 4	90
No. 10	80

Topsoil shall be analyzed for sand, silt, and clay as specified in T 88. Textural analysis shall be as follows:

Soil	Particle Sizes mm	Percent Passing by Weight
Sand	(2.0 – 0.050)	20 – 75
Silt	(0.050 – 0.002)	10 – 60
Clay	(less than 0.002)	5 – 30

920.01.03 Salvaged Subsoil. Salvaged subsoil shall be material salvaged from the project that has been classified as subsoil as specified in the Contract Documents.

920.01.04 Furnished Subsoil. Furnished subsoil shall be natural, friable subsurface soil uniform in texture and not salvaged from the project. Subsoil shall be free from any parts of Johnsongrass, Canada Thistle, or Phragmites. The Contractor shall submit a source of supply for the material to the Administration for approval, prior to use. Material shall conform to Section 916 with the following exceptions:

- (a) The use of recycled portland cement concrete or recycled HMA pavement is prohibited.
- (b) The corrected pH value shall be 5.0 to 7.5.
- (c) The organic matter content shall be 0.1 to 5.0 percent.

Grading analysis shall be as follows:

<u>Sieve Size</u>	<u>Minimum Percent Passing by Weight</u>
2 in.	100
No. 4	85
No. 10	60

Material shall be analyzed for sand, silt and clay as specified in T 88. The textural analysis shall be as follows:

<u>Soil</u>	<u>Particle Sizes mm</u>	<u>Percent Passing by Weight</u>
Sand	(2.0 – 0.050)	20 – 85
Silt	(0.050 – 0.002)	10 – 60
Clay	(less than 0.002)	5 – 40

920.02 Agricultural Limestone. Limestone shall contain not less than 85 percent calcium and magnesium carbonates. Dolomitic (magnesium) limestone shall contain at least 10 percent magnesium as magnesium oxide and 85 percent calcium and magnesium carbonates. Limestone shall conform to the following gradation:

<u>Sieve Size</u>	<u>Minimum Percent Passing by Weight</u>
No. 10	100
No. 20	98
No. 100	50

920.03 Fertilizer.

920.03.01 Granular and Liquid Fertilizer. Fertilizer shall be commercial grade conforming to all State and Federal regulations and the Standards of the Association of Official Analytical Chemists. Standard analyses shall be: 5-20-20, 0-0-60, 15-30-15, 19-19-19, 10-22-22 (50 percent nitrogen from 38-0-0 ureaform), 20-20-20, and 38-0-0 (ureaform). All analyses are subject to approval by the Engineer prior to application.

920.03.02 Fertilizer Packets. Fertilizer shall be contained in a slow release polyethylene perforated bag with micropore holes for controlled feeding. The bag shall contain 4 oz of water soluble fertilizer, analysis 16-8-16 to be effective for approximately eight years. Minimum guaranteed analysis of the packets shall be as follows:

Minimum Analysis:

Total Nitrogen (N) 16%	9% Ammoniacal Nitrogen (NH ₃ N) 7% Nitrate Nitrogen (NO ₃ N)
Available Phosphoric Acid (P ₂ O ₅)	8% from Ammonium Phosphate (NH ₄ PO ₄)
Soluble Potash (K ₂ O)	16% from Potassium Chloride (KCl)
Potential Acidity equivalent to 850 lb Calcium Carbonate (CaCO ₃) per ton.	

920.03.03 Fertilizer Tablets. Fertilizer tablets shall consist of a minimum 21 gram tablet containing a slow release (two year) fertilizer, analysis 20–10–5. Minimum guaranteed analysis of the tablets shall be as follows:

Minimum Tablet Analysis:

Total Nitrogen (N) 20%	7% Water Soluble Organic Nitrogen 13% Water Insoluble Organic Nitrogen
Available Phosphoric Acid (P ₂ O ₅)	10%
Soluble Potash (K ₂ O)	5%

920.03.04 Iron Sulfate. Iron sulfate shall be an approved horticultural product produced as a fertilizer for supplying iron and as a soil acidifier.

920.04 Seed, Seed Mixes, and Sod.

All seed, seed mixes, and sod shall be free from Maryland prohibited noxious weed seeds and the following:

Annual Bluegrass	Giant Foxtail
Bermudagrass	Horse Nettle
Bindweed	Spurred Anoda
Cocklebur	Wild Garlic
Corn Cockle	Wild Onion
Dodder	

920.04.01 Seed. Seed will be sampled and tested by an inspector from the Turf and Seed Section, Maryland Department of Agriculture (MDA), Annapolis, Maryland. All seed containers shall be tagged with a MDA supervised mix program seed tag. Seed shall comply with the Maryland Seed Law, Agricultural Article of the Annotated Code of Maryland. The authority for seed names shall be the current printing of USDA, Agriculture 505 Handbook.

Grass and legume seeds shall conform to the latest construction directives regarding cultivars and varieties and the following:

Seed	Purity Not Less Than %	Weed Seed Not More Than %	Min. Germ. Incl. Hard Seed %	Hard Seed Not to Exceed %
Kentucky Bluegrass (<i>Poa pratensis</i>)	90	0.4	80	—
Canada Bluegrass (<i>Poa compressa</i>)	90	0.5	80	—
Redtop (<i>Agrostis gigantea</i>)	92	0.7	80	—
Lehmann's Lovegrass (<i>Eragrostis lehmanniana</i>)	98	0.5	80	—
Foxtail Millet (<i>Setaria italica</i>)	99	0.1	80	—
Hard and Fine Fescue (<i>Festuca longifolia</i>)	98	0.5	85	—
Sheep Fescue (<i>Festuca ovina</i>)	98	0.5	85	—
Tall Fescue (<i>Festuca arundinacea</i>)	98	0.5	90	—
Chewings Fescue (<i>Festuca rubra commutata</i>)	98	0.5	85	—
Oats (<i>Avena sativa</i>)	99	0.5	90	—
Crownvetch (<i>Coronilla varia</i>)	98	0.5	80	30
Serecia Lespedeza (<i>Lespedeza cuneata</i>)	98	0.5	85	20
Birdsfoot Trefoil (<i>Lotus corniculatus</i>)	97	0.7	85	20
Weeping Lovegrass (<i>Eragrostis curvula</i>)	98	0.5	80	—
Barley (<i>Hordeum vulgare</i>)	98	0.3	90	—
Rye Grain (<i>Secale cereale</i>)	98	0.1	85	—
Perennial Ryegrass (<i>Lolium perennial</i>)	98	0.5	85	—

920.04.02 Seed Mixes. The Contractor or seed supplier shall notify the Turf and Seed Section, Maryland Department of Agriculture, Annapolis, Maryland, at least 10 days prior to the mixing date as to the hour, date, and location of the mixing operation. The Contractor or seed supplier shall assume charges for seed inspections and seed testing service. Seed mixes shall conform to the following:

(a) Permanent Seed Mix.

- 90% Tall Fescue (Certified Seed Only)
- 5% Kentucky Bluegrass (Certified Seed Only)
- 5% Perennial Rye grass (Certified Seed Only)

(b) Temporary Seed Mix

- 95% Barley or Rye
- 5% Foxtail Millet

(c) Cover Companion Seed Mix. Cover Companion Seed Mix for use with Woody Shrub Seed Mix shall conform to 705.01.01 Regional Areas.

- Region 1**
- 35% Tall Fescue
 - 35% Canada Bluegrass
 - 15% Redtop
 - 15% Birdsfoot trefoil (inoculant required)

- Regions 2 & 3**
- 30% Chewings Fescue
 - 30% Canada Bluegrass
 - 10% Redtop
 - 30% Serecia Lespedeza (inoculant required)

(d) Woody Shrub Seed Mix Regions 1, 2 & 3 The woody shrub seed mix shall have a min. purity of 98%

- 25% Amur Honeysuckle (*Lonicera maackii*) or Tatarian Honeysuckle (*L. tatarica*)
- 20% Bristly Locust (*Robina fertilis*)(inoculant required)
- 25% Shrub Lespedeza (*Lespedeza bicolor*) (inoculant required)
- 30% Arrowwood Viburnum (*Viburnum dentatum*)

(f) Wildflower Seed Mix Regions 1, 2, & 3 The wildflower seed mix shall conform to the following:
75% Minimum Germination and 98% Minimum Purity:

%	Common Name	Scientific Name
3 %	Spurred Snapdragon	(<i>Linaria maroccana</i>)
6 %	Plains Coreopsis	(<i>Coreopsis tinctoria</i>)
6 %	Corn Poppy	(<i>Papaver rhoeas</i>)
6 %	Black Eyed Susan	(<i>Rudbeckia hirta</i>)
3 %	Scarlet Sage	(<i>Salvia coccinea</i>)
3 %	Lemon Mint	(<i>Monarda citriodora</i>)
1.2 %	Shasta Daisy	(<i>Chrysanthemum maximum</i>)
1.2 %	New England Aster	(<i>Aster novae angliae</i>)
3 %	Siberian Wallflower	(<i>Cheiranthus allioni</i>)
0.6 %	Evening Primrose	(<i>Oenothera hookerii</i>)
1.2 %	White Yarrow	(<i>Achillea millefolium</i>)
6 %	California Poppy	(<i>Eschscholzia californica</i>)
7 %	Dames Rocket	(<i>Hesperis matronalis</i>)
3 %	Rocket Larkspur	(<i>Delphinium ajacis</i>)
7.6 %	Tall Cornflower	(<i>Centaurea cyanus</i>)
12.2 %	Purple Cornflower	(<i>Echinacea purpurea</i>)

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<u>%</u>	<u>Common Name</u>	<u>Scientific Name</u>
6 %	Lance-leaf Coreopsis	(Coreopsis lanceolata)
1.5 %	Yellow cosmos	(Cosmos sulphureus)
1.5 %	Purple Cosmos	(Cosmos bipinnatus)
3 %	Sweet William	(Dianthus barbatus)
6.6 %	Crimson Clover	(Trifolium incarnatum)
1.2 %	Firewheel	(Gaillardia aristata)
6 %	Blanket Flower	(Gaillardia pulchella)
3 %	Calendula	(Calendula officianialis)
1.2 %	Sunflower Autumn Beauty	(Helianthus Autumn Beauty)

(g) Cover Companion Seed for use with Wildflower Seed Mix. 100% Hard Fescue (*Festuca longifolia*) or Sheep Fescue (*Festuca ovina*)

920.04.03 Sod. Sod shall either be Maryland Certified or Maryland Approved Sod and shall comply with the Maryland Turfgrass Law and Certification Regulations of the Annotated Code of Maryland. Each load of sod shall bear a Maryland State Approved or Certified label at the time of delivery on the job. The sod shall be well rooted and shall be grown in the State of Maryland. It shall be field grown for a minimum of 12 months. Once cut and rolled, sod shall be placed within 48 hours. It shall be cut in strips not less than 14 in. or more than 20 in. wide. Sod shall be machine cut to a uniform thickness of 3/4 in., plus or minus 1/4 in., at the time of cutting. Thickness shall exclude top growth and thatch. Sod shall be relatively free of thatch, 3/8 in. or less at time of cutting. Prior to cutting, sod shall be mowed to a height of 1-1/2 to 2-1/2 in. for Bluegrass, 3/4 to 1 in. for Bermudagrass, and 2 to 2-1/2 in. for Tall Fescue.

920.05 Mulch.

920.05.01 Shredded Hardwood Bark. Shredded hardwood bark shall consist of the bark from hardwood trees which has been milled and screened to a maximum 4 in. particle size and provide a uniform texture free from sawdust, toxic substances, and foreign materials.

920.05.02 Wood Chips. Wood chips shall be produced by a wood chipping machine and be composted. Wood chips shall be a maximum size of 2 X 2 X 0.5 in. Composted wood chips shall be free of toxic substances and any foreign materials. Grading analysis shall be as follows:

<u>Sieve size (inch)</u>	<u>Maximum % Passing by Volume</u>
2	100
1	30
0.5	10

920.05.03 Straw and Hay. Straw shall consist of thoroughly threshed cereal grains. Hay shall consist of forage grasses and legumes. Straw and hay shall be free of noxious weeds and weed seeds as specified in 920.04.

Straw and hay shall be visually inspected to ensure that it is free from mold, foreign substances, plant parts of Canada Thistle, Johnsongrass, or Phragmites, and is in an air-dry condition suitable for placing with mulch blower equipment.]

920.05.04 Wood Cellulose Fiber. Wood cellulose fiber shall be a processed wood product having uniform fiber characteristics which will remain in uniform suspension in water under agitation and will blend with seed, fertilizer, and other additives to form a homogeneous slurry. The fiber shall perform satisfactorily in hydraulic seeding equipment without clogging or damaging the system. The slurry shall contain a green dye that provides easy visual inspection for uniformity of application. The manufacturer shall furnish certification as specified in TC-1.02 showing conformance to the following:

Wood Cellulose Fiber Requirements

Particle Length, in.	Approximately 1/2
Particle Thickness, in.	Approximately 1/16
Net Dry Weight Content Minimum	as stated on bag
TAPPI* T 509, pH	4.0 – 8.5
Ash Content, TAPPI* Standard T 413, %	max 7.0
Water Holding Capacity, % min	90

* Technical Association of Pulp and Paper Industry The material shall be delivered in packages of uniform weight, which shall not exceed 75 lb net weight and shall bear the name of the manufacturer, the net weight, and a supplemental statement of the net weight content.

920.06 Soil Stabilization Matting. Soil stabilization matting shall be supplied in 40 to 96 in. width rolls. The material shall be selected from the Administration's Office of Materials and Technology Prequalified Materials List for the use specified.

Type A. Type A soil stabilization matting shall consist of a machine produced mat of degradable natural or man made fibers. Matting shall be smolder resistant. When a chemical is used, it shall be nonleaching, nontoxic to vegetation and the germination of seed, and noninjurious to the skin. Type A matting shall have a uniform thickness and distribution of fibers throughout. The top and bottom of the matting shall be covered with a degradable extruded plastic netting having a maximum mesh opening of 2 X 2 in. or covered on the top side with netting machine sewn or bonded on 2 in. centers along the longitudinal axis of the material. The average breaking strength of any two strands of netting shall be 5 lb minimum. The netting shall be entwined with the matting fibers in a manner which shall provide sufficient reinforcement against damage during handling and placement and shall resist degradation for a minimum of six months and a maximum of one year.

Type B. Type B soil stabilization matting shall consist of a machine produced mat of nondegradable fibers or elements and have a uniform thickness and distribution of weave throughout.

920.06.01 Staples for Type A Soil Stabilization Matting and Sod. Staples shall be U or T shaped steel wire having minimum gauges of No. 11 and No. 8, respectively. The U shaped staples shall average 1 to 1-1/2 in. wide. The T shaped staples shall have a main and a secondary leg and a 4 in. head. For the length of the staples to be used with the Type A matting, refer to 709.03.03. For sod the U shaped staples shall be a min. length of 6 in. and the T staples shall have a main leg length of 8 in. and a secondary leg length of 1 in.

920.06.02 Fasteners for Type B Soil Stabilization Matting. Fasteners shall be staples or wood stakes. Staples shall be U or T shaped steel wire having minimum gauges of No. 11 and No. 8, respectively. The U shaped staples shall average 1 to 1-1/2 in. wide. The T shaped staples shall have a main and secondary leg and a 4 in. head. Wood stakes shall be sound, rough sawn, hardwood measuring 1 X 3 in. at the top. For the length of the fasteners to be used with the Type B matting, refer to 709.03.03.

920.08 Miscellaneous Landscaping Items.

920.08.01 Water. Water used in the planting, establishing, or caring for vegetation shall be free from any substance that is injurious to plant life.

920.08.02 Peat Moss. Peat moss shall be milled sphagnum peat moss and shall be free from woody substances.

920.08.03 Peat Humus. Peat humus shall originate from fresh water sites of sedge and reed peat deposits in which the organic matter consists of incompletely decomposed plant residues containing a minimum of 70 percent organic material by weight and a negligible amount of woody matter by visual inspection. Inorganic material shall consist only of sand, silt and clay without inclusion of gravel, debris or toxic compounds. Peat humus with a pH value of less than 4.5 shall be corrected to a value of 6.5 by the addition of limestone as directed by the Engineer. Samples of peat humus will be taken by the Engineer and will be tested for conformance to Federal Specification Q-P-166.

920.08.04 Manure. Manure shall be dehydrated cow manure as approved by the Engineer.

920.08.05 Compost. Compost shall be screened, approved by the State Agencies listed below, and subject to approval by the Engineer. Compost shall have a pH between 6.0 and 7.5 except when specified in Section 710 where it shall have a pH between 6.0 and 7.0. It shall be stable and not reheat upon restacking. Compost shall have a moisture content between 30 and 55 percent, a particle size of 0.5 in. or less. Grading analysis shall be as follows:

<u>Sieve Size</u>	<u>Maximum % Passing by Volume</u>
No. 4	90
No. 40	25
No. 200	2.2

Compost shall be one of the following types:

(a) Biosolids Compost (Type A). Biosolids compost will be approved for distribution by the Maryland Department of the Environment. Compost shall have a soluble salt concentration not to exceed 10 dS (mmhos/cm).

(b) Source-Separated Compost (Type B). Source-separated compost will be approved by the Maryland Department of Agriculture (MDA). Compost shall be produced by a MDA certified compost operator. Compost shall have a soluble salt concentration not to exceed 5 dS (mmhos/cm). Source-separated compost shall be one of the following types:

- (1) Tree leaf compost.
- (2) Non-tree leaf compost. When compost is from lawn clippings, it shall be tested for contaminants in conformance with COMAR 15.18.04.05.

920.08.06 Insecticide. Insecticide shall be an EPA approved chemical that provides protection against insect pests. The insecticide will be subject to approval by the Engineer.

920.08.07 Herbicide. Herbicide shall be an EPA approved chemical to control and prevent regrowth of undesirable vegetation. The herbicide will be subject to approval by the Engineer.

920.08.08 Marking Dye. Marking dye shall be herbicide compatible and oil or water soluble, as required. Marking dye shall be from a commercial source as approved by the Engineer.

920.08.09 Stakes. Stakes for supporting trees shall be rough sawn, straight grain hardwood reasonably free from knot holes, bark, wane, warp, and splits, as determined by the Engineer. Stakes shall be full cut 2 X 2 in. thickness. The length shall be as specified in the Contract Documents.

920.08.10 Outline Stakes. Outline stakes shall be full cut 1-3/4 X 1-3/4 in. sound hardwood, 48 in. long, as approved by the Engineer. They shall have the words "MOW LIMIT" stenciled in orange paint vertically on one side in 1-1/2 in. letters beginning within 2 in. from the top of the stake.

920.08.11 Wire. Wire shall be No. 12 gauge and 14 gauge new annealed galvanized wire, as approved by the Engineer.

920.08.19 Antidesiccant. Antidesiccant shall be an approved emulsion which will provide a film over plant surfaces permeable enough to permit transpiration.

920.08.21 Pegs. Pegs shall be wooden wedges 1/2 X 1 X 6 in. to 1/2 X 1 X 12 in. as approved by the Engineer.

920.08.22 Water Absorbent Gel. Water absorbent gel shall be a cross linked polyacrylamide horticultural product used to maintain moisture around bare root plants and as a soil conditioner. Formulas used shall conform to the manufacturer's recommendations.