

CATEGORY 700 LANDSCAPING

SECTION 701 — TOPSOIL AND SUBSOIL

701.01 DESCRIPTION. Salvage, furnish, and place topsoil and subsoil.

701.02 MATERIALS.

Salvaged Topsoil	920.01.01
Furnished Topsoil	920.01.02
Salvaged Subsoil	920.01.03
Furnished Subsoil	920.01.04
Limestone	920.02.01
Sulfur	920.02.02
Gypsum	920.02.04
Compost	920.02.05

701.03 CONSTRUCTION.

701.03.01 General.

- (a) **Schedule.** Perform topsoil and subsoil operations when soil moisture and weather conditions are suitable. Cease operations when conditions are unsuitable.
- (b) **Nutrient Management Plan (NMP).** Soil testing will be performed and a NMP will be developed by the Administration. Apply fertilizer and soil amendments as specified in the NMP.
- (c) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 24 hours after applying fertilizer.

701.03.02 Salvaging Topsoil and Subsoil.

- (a) **Evaluation of Weeds.** Refer to 920.01.01. Topsoil and subsoil will be inspected and shall be free of prohibited weeds before salvaging operations. Prevent the spread of these weeds as directed.

- (b) **Removal.** Mow or remove vegetation from the areas where soil is to be salvaged. Remove topsoil and subsoil to the depth as specified or directed. Transport soils separately and keep them apart from other materials.
- (c) **Storage.** Construct storage areas on well drained land, away from streams, drainage areas, and floodplains as specified in Section 308.

Install and maintain silt fence around the edge of the stockpile areas as specified in 308.03.29 before placing stockpiles.

Maintain topsoil and subsoil separately, in neat stockpiles away from other material. Apply temporary mulch or temporary seed immediately after final shaping as specified in Section 704.

- (d) **Excess.** Topsoil and subsoil are Administration property. Do not remove soils without written approval.

701.03.03 Placing Salvaged Topsoil and Subsoil.

- (a) **Reevaluation of Weeds.** Soils that contain prohibited weeds will be reevaluated. Do not remove surface debris or transport soil from stockpiles before the reevaluation is completed.
- (b) **Debris Removal.** Remove grass, weeds, brush, and other objectionable material from the surface of stockpiles before transporting soil.
- (c) **Site Preparation.** Ensure the site is uniformly graded true to line and cross section in preparation for placing topsoil or subsoil.
- (d) **Placing, Spreading, and Compacting Subsoil.** Place, spread, and compact subsoil in layers up to 8 in. thickness to provide a firm and uniform subsoil base.

Track slopes 4:1 to 2:1 with cleated track equipment operated perpendicular to the slope.

Check subsoil thickness, lines, grades, and elevations to ensure the completed work is as specified. Remove stones and other debris with a length or width greater than 4 in. from the surface of the subsoil before placing and spreading topsoil.

- (e) **Placing and Spreading Topsoil.** Place and spread topsoil over the designated areas to the specified depth.

When topsoil can be blended with the substrate, till and mix the topsoil into the substrate.

When topsoil cannot be blended with the substrate, roughen the surface of the substrate to provide a bond for the topsoil layer.

- (f) **Grading Topsoil.** Grade the soil to provide a uniform surface true to depth, line, cross section, and elevation to ensure the completed work is as specified after settlement.

Track slopes 4:1 to 2:1 with cleated track equipment operated perpendicular to the slope.

Remove stones and other debris with a length or width greater than 3 in. from the surface of the topsoil when grading is completed.

- (g) **Amending Topsoil and Subsoil.** Apply soil amendments (limestone, sulfur, gypsum, compost) to salvaged topsoil and salvaged subsoil as specified in the NMP.

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

- (a) **Responsibility.** Make arrangements and assume responsibility for consents, agreements, and payments with property owners who provide, prepare, or transport soils.
- (b) **Storage.** Construct storage areas and maintain stockpiles as specified in 701.03.02(c).

701.03.05 Inspection and Acceptance. Submit a request for Acceptance when operations are completed. Inspection will be conducted to verify that operations were completed as specified. Acceptance will be granted at that time.

701.04 MEASUREMENT AND PAYMENT. Topsoil and subsoil will be measured and paid for at the Contract unit price for one or more of the specified items. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

701.04.01 Salvaging Topsoil will not be measured but the cost will be incidental to the Contract unit price for Class 1 Excavation.

701.04.02 Salvaging Subsoil will not be measured but the cost will be incidental to the Contract unit 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 specified depth.

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

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 specified depth.

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

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

SECTIONS 702 — 703 RESERVED

SECTION 704 — TEMPORARY SEED AND TEMPORARY MULCH

704.01 DESCRIPTION. Apply temporary seed and temporary mulch.

704.02 MATERIALS.

Fertilizer	920.03.01
Straw Mulch	920.04.01
Wood Cellulose Fiber	920.04.02
Seed	920.06
SHA Temporary Seed Mix	920.06.07
Water	920.09.01

704.03 CONSTRUCTION.**704.03.01 General.**

- (a) **Schedule.** Apply temporary seed and temporary mulch any time of the year to areas that are not ready for permanent stabilization.
- (b) **Nutrient Management Plan (NMP).** The fertilizer application rate specified in 704.03.02(c) shall be the NMP rate for temporary seeding unless the Administration develops a substitute NMP.
- (c) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 24 hours after applying fertilizer.

704.03.02 Temporary Seed. Prepare the soil and apply seed, fertilizer, mulch, and wood cellulose fiber to areas that will remain undisturbed for 2 to 12 months.

- (a) **Soil Preparation.** Complete grading and shaping operations as directed. Loosen soil surfaces before seeding.
- (b) **Application Equipment.** Refer to 705.03.05.
- (c) **Application Rates.** Apply materials according to the following table. Do not apply fertilizer if the area was fertilized within the previous 3 months.

APPLICATION RATES - TEMPORARY SEED		
MATERIAL	LB PER 1000 FT²	LB PER ACRE
SHA Temporary Seed Mix	2.9	125
Fertilizer (15-30-15)	10.3	450
Straw Mulch	91.8	4000
Wood Cellulose Fiber	17.2	750

(d) Seeding.

- (1) **Hydroseeders.** Apply seed and fertilizer mixtures within two hours of mixing.
- (2) **Mechanical Seeder.** Incorporate seed and fertilizer to a depth of 1/8 to 1/4 in.

- (3) **After Seeding.** Immediately apply straw mulch.
- (e) **Mulching.** Mulch shall cover 90 percent of the soil surface when applied as follows:
 - (1) **Blower.** Apply mulch to a loose depth of 3/4 to 2 in.
 - (2) **Manually.** Apply mulch to a loose depth of 1-1/2 to 3 in.
- (f) **Securing Mulch.** Immediately after applying mulch secure with wood cellulose fiber. Do not displace the mulch.

704.03.03 Temporary Mulch. Apply straw mulch and wood cellulose fiber to areas that will be redisturbed in within 2 months.

- (a) **Soil Preparation.** Do not disturb or till soil.
- (b) **Application Equipment.** Refer to 705.03.05.
- (c) **Application Rates.** Apply materials as follows:

APPLICATION RATES - TEMPORARY MULCH		
MATERIAL	LB PER 1000 FT²	LB PER ACRE
Straw Mulch	91.8	4000
Wood Cellulose Fiber	17.2	750

- (d) **Mulching.** Refer to 704.03.02(e).
- (e) **Securing Mulch.** Refer to 704.03.02(f).

704.03.04 Repairing Defective Areas. Repair Temporary Seed or Temporary Mulch that is defective. Complete repairs before Acceptance.

704.03.05 Acceptance. Submit a request for Acceptance when operations are completed. Inspection will be conducted to verify completion. Acceptance will be granted when at least 90 percent of the soil surface is covered with secured mulch.

704.03.06 Repairs after Acceptance. Repair or replace Temporary Seed or Temporary Mulch, when directed after Acceptance, at the Contract unit price as additional work.

704.04 MEASUREMENT AND PAYMENT. Temporary Seed and Temporary Mulch will be measured and paid for at the Contract unit price for one or more of the specified items. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

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

704.04.02 Temporary Mulch will be measured and paid for at the Contract unit price per square yard.

SECTION 705 — TURFGRASS ESTABLISHMENT

705.01 DESCRIPTION. Prepare soil and establish turfgrass.

705.02 MATERIALS.

Limestone	920.02.01
Sulfur	920.02.02
Gypsum	920.02.04
Compost	920.02.05
Fertilizer	920.03.01
Straw Mulch	920.04.01
Wood Cellulose Fiber	920.04.02
Soil Stabilization Matting	920.05.01
Fasteners	920.05.02
Seed	920.06
SHA Turfgrass Seed Mix	920.06.07(a)
SHA Special Purpose Seed Mix	920.06.07(b)
SHA Temporary Seed Mix	920.06.07(c)
Water	920.09.01

705.03 CONSTRUCTION.

705.03.01 General.

(a) 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.

(b) Seeding Seasons and Seed Mixes. Perform turfgrass establishment when the temperature is above 32 F and the soil is not frozen according to the following schedule:

SEEDING SEASONS AND SEED MIXES				
REGION	SEEDING SEASON - MONTH/DAY			
	Spring	Summer	Fall	Late Fall
	SHA Turfgrass Seed Mix			
1	4/1 to 6/15	6/16 to 7/31	8/1 to 10/1	10/2 to 11/1
2	3/1 to 5/15	5/16 to 7/31	8/1 to 10/20	10/21 to 11/20
3	3/1 to 5/1	5/2 to 7/31	8/1 to 10/31	11/1 to 11/30
1, 2, and 3	-	Plus Additive A or B	-	Plus Additive C
	Plus Additive D when seeding: <ul style="list-style-type: none"> • Areas 30 ft and greater from the pavement edge • Slopes 4:1 and steeper 			
	When seeding areas within 4 miles of a State airport: Areas flatter than 4:1 - Use no Additives Slopes 4:1 and steeper - Use SHA Special Purpose Seed Mix in lieu of SHA Turfgrass Seed Mix			
	<p style="text-align: center;">Additives</p> A = Weeping Lovegrass C = SHA Temporary Seed Mix B = Foxtail Bristlegrass D = Sericea Lespedeza			

- (c) **Nutrient Management Plan (NMP).** Soil testing will be performed and a NMP will be developed by the Administration. Replace application rates of 705.03.06 as required by the NMP.

When a NMP is not available, 1000 lb. per acre of 20-16-12 (83% UF with MAP & SOP) fertilizer shall be the NMP rate for turfgrass establishment.

- (d) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 24 hours after applying fertilizer.

705.03.02 Grade Repair. Ensure that soil meets specified grades. Repair any gullies, washes, or disturbed areas that develop before preparing soil or seedbed.

705.03.03 Preparing Soil. Loosen the soil as follows:

- (a) **Topsoiled Areas 4 in. Thickness and Greater.** Loosen topsoil immediately before seeding by disking, raking, or rototilling to a depth of at least 3 in.
- (b) **Topsoiled Areas 2 in. Thickness.** Loosen topsoil as specified in (a) to a depth of 2 in.
- (c) **Nontopsoiled Areas.** Loosen subsoil as specified in (a) to a depth of 1 in.
- (d) **Slopes 4:1 to 2:1.** Refer to 701.03.03(f).
- (e) **Serrated Cut Slopes.** Do not loosen soil.

705.03.04 Preparing Seedbed. Till the seedbed so that it conforms to the specified finished grade and provides a uniform and porous surface that is free of weed and plant growth.

- (a) **Areas Flatter than 4:1.** Remove cleat marks and debris from the soil surface as follows:
- (1) **Within 15 ft of Pavement Edge.** Remove clods, stones, and debris with a length or width greater than 1-1/2 in.

(2) **Near Commercial or Residential Property.** As in (1), above.

(3) **All Other Areas.** Remove stones and debris with a length or width greater than 2-1/2 in.

(b) **Slopes 4:1 and Steeper.** Remove clods, stones, and debris with a length or width greater than 3.0 in. from the soil surface.

705.03.05 Application Equipment. Use hydroseeders, spreaders, drills, mulch blowers, or other approved machinery. Calibrate equipment before application. Apply materials accurately and uniformly to avoid misses and overlaps.

Hydroseeders shall be equipped with an agitation system able to keep solids in suspension, and have a gauge to show fill levels and tank capacity. Operate hydroseeders and spinner spreaders during non-windy weather. Do not allow materials to blow onto sensitive areas or structures.

Direct hydroseeding mixtures so the droplets produce a uniform spray. Do not allow materials to runoff or cause erosion. Mechanical seeders shall be capable of placing seed and other materials at the specified rate.

705.03.06 Application Rates. Refer to 705.03.01(b) and include seed additives as specified. Apply materials as follows:

APPLICATION RATES		
MATERIAL	LB PER 1000 FT ²	LB PER ACRE
LIMESTONE Regions 1 and 2: Limestone Region 3: Dolomitic Limestone	0 to 200 ^a 0 to 185 ^a	0 to 8700 ^a 0 to 8050 ^a
SULFUR All Areas	0 to 30 ^a	0 to 1300 ^a
GYPSUM All Areas except Serrated Cut Slopes	0 to 92 ^a	0 to 4000 ^a
COMPOST All Areas except Serrated Cut Slopes	0 to 1.4 yd ³ compost per 24 yd ³ of topsoil ^a	
SEED MIXES		
SHA Turfgrass Seed Mix Areas less than 30 ft from the pavement edge flatter than 4:1, and at facilities	4.6	200
SHA Turfgrass Seed Mix & Sericea Lespedeza Areas 30 ft and more from the pavement edge, and slopes 4:1 and steeper SHA Turfgrass Seed Mix Sericea Lespedeza	2.3 0.46	100 20
SHA Special Purpose Seed Mix Slopes 4:1 and steeper within four miles of a State airport	4.6	200
ADDITIVE SEED		
A = Weeping Lovegrass	0.046	2
B = Foxtail Bristlegrass	0.23	10
C = SHA Temporary Seed Mix	0.57	25
D = Sericea Lespedeza	0.46	20
FERTILIZER AT SEEDING		
Topsoiled Areas		
20-16-12 (83% UF with MAP & SOP)	23.0 ^a	1000 ^a
38-0-0 (UF)	0 to 9.2 ^{a,b}	0 to 400 ^{a,b}
0-0-50 (SOP)	0 to 5.7 ^{a,b}	0 to 250 ^{a,b}
Nontopsoiled Areas		
20-16-12 (83% UF with MAP & SOP)	23.0 ^a	1000 ^a
38-0-0 (UF)	8.0 to 17.2 ^{a,b}	350 to 750 ^{a,b}
0-0-50 (SOP)	0 to 5.7 ^{a,b}	0 to 250 ^{a,b}
MULCH		
Straw Mulch Secured with Wood Cellulose Fiber	92	4000
Wood Cellulose Fiber	34	1500
MULCH BINDER Wood Cellulose Fiber	17	750
REFERTILIZING		
5-20-20	4.6	200
38-0-0 (UF)	11.5	500

Note: UF = Ureaform MAP = Monoammonium Phosphate SOP = Sulfate of Potash

^a The NMP will specify the application rate.

^b When application of 20-16-12 is below 1000 lb. per acre, apply 38-0-0 and 0-0-50 per NMP.

705.03.07 Incorporating Soil Amendments. Incorporate amendments (limestone, sulfur, gypsum, compost) into the soil as follows:

(a) Topsoiled Areas Flatter than 4:1.

(1) Topsoil Depth of 2 in. Incorporate to a 2 in. depth.

(2) Topsoil Depth 4 in. and Greater. Incorporate to 3 in. depth.

(b) Topsoiled Areas 4:1 and Steeper. Apply limestone, sulfur, and gypsum immediately before or after tracking. Incorporate compost into topsoil in a separate operation before spreading topsoil.

(c) Nontopsoiled Areas and Serrated Cut Slopes. Apply the amendments to the soil surface after completing soil loosing operations.

Fertilizer may be incorporated into the soil with soil amendments.

705.03.08 Fertilizing and Seeding. Apply fertilizer and seed to previously prepared areas. On slopes 4:1 and steeper, including serrated cut slopes, apply seed, fertilizer, and mulch in 15 ft maximum vertical increments.

(a) Hydraulic Seeding. Apply fertilizer and seed mixtures within two hours after mixing.

Inoculate sericea lespedeza seed with 10 times the amount of inoculant specified on the inoculant package label for dry seeding. Apply seed within one hour of inoculation, or reinoculate and apply seed within one hour of reinoculation.

(b) Mechanical Seeding. Incorporate seed and fertilizer to a depth of 1/8 to 1/4 in. below the soil surface.

Dampen sericea lespedeza seed with water, and add the amount of inoculant specified on the package label before mixing with other seed. Apply seed within 24 hours of inoculation, or reinoculate and apply seed within 24 hours of reinoculation.

705.03.09 Mulching. Apply mulch immediately after seeding in all seasons except as allowed in (b) and (c).

(a) **Mulch Cover.** Cover at least 90 percent of the soil surface with mulch as follows:

(1) **Mulch Blower.** Apply mulch to a loose depth of 3/4 to 2 in.

(2) **By Hand.** Apply mulch to a loose depth of 1-1/2 to 3 in.

(b) **Wood Cellulose Fiber.** Wood cellulose fiber may be approved as a replacement for straw mulch on slopes 1-1/2:1 and steeper where straw application equipment is impractical.

Apply at least 70 percent of the wood cellulose fiber mulch after and separately from the seed and fertilizer during the Summer Seeding Season.

(c) **Summer Seeding Season.** In medians flatter than 4:1 open to traffic, install Type A Soil Stabilization Matting in lieu of straw mulch over seed and fertilizer as specified in Section 709. Keying-in shall not be performed within curbed medians.

705.03.10 Securing Mulch. Secure straw immediately after the completion of mulching operations by applying wood cellulose fiber uniformly without displacing the mulch.

705.03.11 Seeding Phase Acceptance. Submit a request for Seeding Phase Acceptance when operations are completed. Inspection will be conducted to verify completion. Seeding Phase Acceptance will be granted at that time.

705.03.12 Establishment Phase. The Establishment Phase will begin upon Seeding Phase Acceptance.

705.03.13 Overseeding and Reseeding. When turfgrass establishment is not acceptable, perform overseeding and reseeding as directed. Do not apply additional fertilizer or soil amendments unless directed.

(a) **Overseeding Thin Turf.** Overseeding consists of seeding and mulching areas where turfgrass coverage is 40 to 94 percent.

(1) **Methods.** Cut the turfgrass to a height of 3 to 4 in. and remove debris that will interfere with seeding. Do not apply herbicide or till soil. Apply seed mixtures, seed additives, mulch, and secure mulch as specified in 705.03.01 and 705.03.05 thru .10.

(2) Coverage. Ensure at least 90 percent of the soil surface is covered with mulch or turfgrass when overseeding is completed.

(b) Reseeding Failed Turf. Reseeding consists of tilling, seeding and mulching areas where turfgrass coverage is less than 40 percent.

Grade, prepare soil and seedbed, seed, mulch, and secure as specified in 705.03.01 thru .10.

705.03.14 Final Acceptance. The Engineer and the Landscape Operations Division will complete an Inspection Report of turfgrass height, color, and percent coverage. When it is not possible to perform the Inspection, Final Acceptance will be delayed until Inspection is possible.

The Inspection Report will be included in the Punch List requirements for the project. Complete the Punch List requirements as directed.

Final Acceptance will be granted when the turfgrass seedlings have grown at least 4 in., exhibit dark green color, and percent coverage as follows:

TURFGRASS ESTABLISHMENT COVERAGE		
AREAS	SHA TURFGRASS SEED MIX or SHA SPECIAL PURPOSE SEED MIX	OTHER DESIRABLE VEGETATION
	Seedling Coverage	
Areas flatter than 4:1; and slopes 4:1 and steeper not tracked with cleated equipment	at least 95% *	up to 5%
Slopes 4:1 and steeper tracked with cleated equipment	at least 50% *	up to 50%

* Includes coverage of additive seed species when included.

705.03.15 Mowing. Mow as specified in the Integrated Vegetation Management Manual for Maryland Highways and as follows:

MOWING HEIGHT				
AREAS	TRACTOR CUTTING		HAND CUTTING	
	Max Height Before Mowing In.	Height of Cut In.	Max Height Before Mowing In.	Height of Cut In.
General Areas	18	4 - 5	10	3 - 4
In Medians or Adjacent to Commercial or Residential Areas	12	4 - 5	8	3 - 4

705.03.16 Refertilizing. Apply 5-20-20 and 38-0-0 (UF) fertilizer 4 to 12 months after seeding as directed.

REFERTILIZING TURFGRASS AREAS			
AREAS	REGIONS	NUMBER OF APPLICATIONS	TIMING
Topsoiled	1 and 2	1	April or September
Nontopsoiled and Serrated Cut Slopes	1 and 2	1	April or September
	3	2	April and September

705.04 MEASUREMENT AND PAYMENT. Turfgrass establishment will be measured and paid for at the Contract unit price for one or more of the specified items. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

705.04.01 Turfgrass Establishment. Turfgrass Establishment including preparing soil, preparing seed bed, applying fertilizer, seed mixes, seed additives, overseeding, reseeding, mulching, securing mulch, and repairing unacceptable areas will be measured and paid for at the Contract unit price per square yard.

- (a) **Payment Schedule.** Payments will be made according to the following Schedule when construction requirements are met:

PAYMENT SCHEDULE		
CONSTRUCTION REQUIREMENTS	PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
705.03.01 thru .11	80	At Seeding Phase Acceptance
705.03.12 thru .14	20	At Final Acceptance
Total Payment	100%	

- (b) **Forfeiture.** Failure to complete operations as required in conformance with the Payment Schedule will result in forfeiture of that percentage of payment.

705.04.02 Applying Limestone to Salvaged Topsoil and Nontopsoiled Areas per ton.

705.04.03 Applying Sulfur to Salvaged Topsoil and Nontopsoiled Areas per ton.

705.04.04 Applying Gypsum to Salvaged Topsoil and Nontopsoiled Areas per ton.

705.04.05 Applying Compost to Salvaged Topsoil and Nontopsoiled Areas per cubic yard.

705.04.06 Applying 38-0-0 Ureaform Fertilizer to Nontopsoiled Areas per pound.

705.04.07 Refertilizing per pound.

705.04.08 Tractor and Hand Mowing per hour.

705.04.09 Amending furnished topsoil and furnished subsoil will not be measured but the cost will be incidental to the Contract unit price for Placing Furnished Topsoil and Placing Furnished Subsoil.

SECTION 706 — SHRUB SEEDING

706.01 DESCRIPTION. Perform shrub seeding.

706.02 MATERIALS.

Limestone	920.02.01
Sulfur	920.02.02
Compost	920.02.05
Fertilizer	920.03.01
Straw Mulch	920.04.01
Wood Cellulose Fiber	920.04.02
Meadow Forb Seed	920.06 and 920.06.06(d)
Meadow Grass, Sedge and Rush Seed	920.06 and 920.06.06(e)
Shrub Seed	920.06 and 920.06.06(g)
SHA Special Purpose Seed Mix	920.06 and 920.06.07(b)
SHA Temporary Seed Mix	920.06 and 920.06.07(c)
Water	920.09.01

706.03 CONSTRUCTION.

706.03.01 General.

(a) **Regional Areas.** Refer to 705.03.01(a).

(b) **Seeding Seasons.** Perform shrub seeding when the temperature is above 32 F and the soil is not frozen according to the following schedule:

SEEDING SEASONS AND SEED				
REGIONS	SEASON - MONTH/DAY			
	Spring	Summer	Fall	Late Fall
	Shrub Seed			
1	3/1 to 6/15	6/16 to 7/31	8/1 to 10/1	10/2 to 11/1
2	2/15 to 5/15	5/16 to 7/31	8/1 to 10/20	10/21 to 11/20
3	2/1 to 5/1	5/2 to 7/31	8/1 to 10/31	11/1 to 11/30
1, 2, and 3	Plus Additive A and C	Plus Additive A, B and C	Plus Additive A and C	Plus Additive A, B and C
	Additives A = SHA Special Purpose Seed Mix C = Upland Meadow Seed or B = SHA Temporary Seed Mix Lowland Meadow Seed			

- (c) **Nutrient Management Plan (NMP).** Soil testing will be performed and a NMP will be developed by the Administration. Replace application rates of 706.03.04 as required by the NMP.

When a NMP is not available, 600 lb. per acre of 20-16-12 (83% UF with MAP & SOP) fertilizer shall be the NMP rate for shrub seeding.

- (d) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the SHA Nutrient Management Reporting Form. Submit the Form to the Engineer within 24 hours after applying fertilizer.

706.03.02 Preparing Soil. Refer to 705.03.03.

706.03.03 Seed Delivery, Weighing, and Mixing.

- (a) **Delivery.** Shrub seed shall be delivered unmixed.
- (b) **Weighing and Mixing.** Test seed as specified in 920.06.05 before weighing and mixing.

Use a scale with 0.01 oz accuracy to verify application rates and quantities of seed.

Mix and apply seed separately or with other specified seed.

706.03.04 Application Rates. Refer to 706.03.01(b) and include seed additives as specified. Apply materials as follows:

TABLE 1 - APPLICATION RATES		
MATERIAL	LB PER 1000 FT²	LB PER ACRE
LIMESTONE	0 to 50 ^a	0 to 2,000 ^a
SULFUR	0 to 13 ^a	0 to 550 ^a
COMPOST	0 to 1.4 yd ³ Compost per 24 yd ³ of Topsoil ^a	
SHRUB SEED		
Upland Shrub Seed	Refer to Table 2 Upland Shrub Seed	Refer to Table 2 Upland Shrub Seed
Lowland Shrub Seed	Refer to Table 3 Lowland Shrub Seed	Refer to Table 3 Lowland Shrub Seed
ADDITIVE SEED		
SHA Special Purpose Seed Mix	0.5	22
SHA Temporary Seed Mix	1.1	50
Upland Meadow Seed Include With Upland Shrub Seed	Refer to 707.03.07, Table 2 Upland Meadow Seed	Refer to 707.03.07, Table 2 Upland Meadow Seed
Lowland Meadow Seed Include With Lowland Shrub Seed	Refer to 707.03.07, Table 3 Lowland Meadow Seed	Refer to 707.03.07, Table 3 Lowland Meadow Seed
FERTILIZER AT SEEDING		
20-16-12 (83% UF with MAP & SOP)	13.8 ^a	600 ^a
38-0-0 (UF)	0 to 3.0 ^{a,b}	0 to 130 ^{a,b}
11-52-0 (MAP)	0 to 6.0 ^{a,b}	0 to 270 ^{a,b}
0-0-50 (SOP)	0 to 5.0 ^{a,b}	0 to 220 ^{a,b}
MULCH		
Straw Mulch	66	3000
Wood Cellulose Fiber Mulch Binder	23	1000
REFERTILIZING		
5-20-20	2.3	100
38-0-0 (UF)	5.7	250

Note: UF = Ureaform MAP = Monoammonium Phosphate SOP = Sulfate of Potash

^a The NMP will specify the application rate.

^b When application of 20-16-12 is below 600 lb per acre, apply 38-0-0, 11-52-0, and 0-0-50 per NMP.

TABLE 2 - UPLAND SHRUB SEED					
SPECIES Select 6 Marked 'x'	SEEDING RATE		REGION		
	Oz per 1000 Ft ²	Lb per Acre	1	2	3
black chokeberry	0.37	1.0	x	x	x
bristly locust *	0.92	2.5	x		
chokecherry	1.10	3.0	x	x	
fragrant sumac	1.10	3.0	x		
gray dogwood	1.10	3.0	x	x	
mapleleaf viburnum	0.55	1.5		x	x
nannyberry	1.10	3.0	x	x	x
red elderberry	0.18	0.5	x		
smooth sumac	1.10	3.0	x	x	x
spicebush	1.10	3.0		x	x
staghorn sumac	1.10	3.0	x	x	x
witch hazel	1.10	3.0		x	x

TABLE 3 - LOWLAND SHRUB SEED					
SPECIES Select 6 Marked 'x'	SEEDING RATE		REGION		
	Oz per 1000 Ft ²	Lb per Acre	1	2	3
American cranberrybush	1.10	3.0	x	x	
American black elderberry	0.92	2.5	x	x	x
common buttonbush	1.29	3.5	x	x	x
common winterberry	1.10	3.0	x	x	
desert false indigo *	1.10	3.0		x	x
inkberry	1.29	3.5		x	x
ninebark	0.37	1.0	x	x	
red chokeberry	0.73	2.0	x	x	x
redosier dogwood	1.29	3.5	x	x	
silky dogwood	0.73	2.0		x	x
southern arrowwood	1.29	3.5	x	x	x
steplebush	0.37	1.0		x	x
swamp Rose	0.55	1.5		x	x

*Apply seed with inoculant labeled for use with the species.

706.03.05 Application Equipment. Refer to 705.03.05.

706.03.06 Fertilizing and Seeding. Apply seed and fertilizer only to previously prepared sites. Apply up to 150 pounds per acre of wood cellulose fiber mulch binder with seed and fertilizer mixtures.

Apply fertilizer and seed mixtures within two hours after mixing. Inoculate bristly locust and desert false indigo with 10 times the quantity of inoculant required for dry seeding. Apply seed within one hour of inoculation, or reinoculate and apply seed within one hour of reinoculation.

On slopes 4:1 and steeper, including serrated cut slopes, apply seed, fertilizer and mulch in 15 ft maximum vertical increments.

706.03.07 Mulching. Refer to 707.03.11.

706.03.08 Securing Mulch. Secure straw mulch immediately after application by applying wood cellulose fiber uniformly without displacing the mulch.

706.03.09 Seeding Phase Acceptance. Submit a request for Seeding Phase Acceptance when operations are completed. Inspection will be conducted to verify completion. Seeding Phase Acceptance will be granted at that time.

706.03.10 Establishment Phase. The Establishment Phase will begin upon Seeding Phase Acceptance.

706.03.11 Final Acceptance. The Engineer and the Landscape Operations Division will complete an Inspection Report of seedling height, color, and percent coverage. When it is not possible to perform the inspection, Final Acceptance will be delayed until inspection is possible.

The Inspection Report will be included in the Punch List requirements for the project. Complete the Punch List requirements as directed.

Final Acceptance will be granted when the seedlings have grown at least 4 in., exhibit dark green color, and percent coverage as follows:

SHRUB SEEDING COVERAGE		
AREAS	SHA SPECIAL PURPOSE SEED MIX, SHA TEMPORARY SEED MIX, SHRUB SEED, and MEADOW SEED	TOTAL VEGETATION COVER
	Seedling Coverage	
Areas flatter than 4:1; and slopes 4:1 and steeper not tracked with bulldozer	at least 70%	at least 95%
Slopes 4:1 and steeper tracked with bulldozer	at least 45%	at least 95%

706.03.12 Refertilizing. Apply 5-20-20 and 38-0-0 (UF) fertilizer 4 to 12 months after seeding as directed.

706.04 MEASUREMENT AND PAYMENT. Shrub Seeding will be measured and paid for at the Contract unit price for one or more of the Specified items. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

706.04.01 Upland Shrub Seeding. Upland Shrub Seeding, including preparing soil, applying fertilizer, shrub seed, additive seed, mulch, and securing mulch will be measured and paid for at the Contract unit price per square yard.

Payment Schedule. Payments will be made according to the following Schedule when construction requirements are met:

PAYMENT SCHEDULE			
CONSTRUCTION REQUIREMENTS		PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
706.03.01 thru .09	Seeding Phase	80	At Seeding Phase Acceptance
706.03.10 and .11	Establishment Phase and Final Acceptance	20	At Final Acceptance
Total Payment		100%	

Forfeiture. Failure to complete operations as required or directed in conformance with the Payment Schedule will result in forfeiture of that percentage of payment.

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706.04.02 Lowland Shrub Seeding. Lowland Shrub Seeding, including preparing soil, applying fertilizer, shrub seed, additive seed, mulch, and securing mulch will be measured and paid for at the Contract unit price per square yard.

Payment Schedule. Refer to 706.04.01.

Forfeiture. Refer to 706.04.01.

706.04.03 Applying Limestone to Salvaged Topsoil and Nontopsoiled Areas per ton.

706.04.04 Applying Sulfur to Salvaged Topsoil and Nontopsoiled Areas per ton.

706.04.05 Applying Compost to Salvaged Topsoil and Nontopsoiled Areas per cubic yard.

706.04.06 Refertilizing per pound.

706.04.07 Amending furnished topsoil and furnished subsoil will not be measured but the cost will be incidental to the Contract unit price for Placing Furnished Topsoil and Placing Furnished Subsoil.

**SECTION 707 — MEADOW ESTABLISHMENT
AND WILDFLOWER SEEDING**

707.01 DESCRIPTION. Perform meadow establishment and wildflower seeding.

707.02 MATERIALS.

Limestone	920.02.01
Sulfur	920.02.02
Compost	920.02.05
Fertilizer	920.03.01
Straw Mulch	920.04.01
Wood Cellulose Fiber	920.04.02
Meadow Forb Seed	920.06 and 920.06.06(d)
Meadow Grass, Sedge and Rush Seed	920.06 and 920.06.06(e)
Wildflower Seed	920.06 and 920.06.06(f)
SHA Special Purpose Seed Mix	920.06 and 920.06.07(b)

Water	920.09.01Seed
Carrier	920.09.02
Pesticides	920.09.03

707.03 CONSTRUCTION. Complete 707.03.01 thru .14 when performing meadow establishment. Complete 707.03.15 thru .26 when performing wildflower seeding.

707.03.01 Meadow Establishment - General.

- (a) **Regional Areas.** Refer to 705.03.01.
- (b) **Seeding Seasons.** Perform seeding when the temperature is above 32 F and the soil is not frozen according to the following schedule:

SEEDING SEASONS - MONTH/DAY		
REGION	SPRING	FALL
1	3/1 to 4/31	8/15 to 9/30
2	2/15 to 4/15	9/1 to 10/15
3	2/1 to 3/31	9/15 to 10/31

- (c) **Pesticide Application.** Refer to 710.03.01(c).
- (d) **Pesticide Application Reporting.** Refer to 710.03.01(d).
- (e) **Nutrient Management Plan (NMP).** Soil testing will be performed and a NMP will be developed by the Administration. Replace application rates of 707.03.08 as required by the NMP.

When a NMP is not available, 400 lb. per acre of 20-16-12 (83% UF with MAP & SOP) fertilizer shall be the NMP rate for meadow establishment.

- (f) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 24 hours after applying fertilizer.

707.03.02 Submittals. Submit the following items:

- (a) **Seeding Schedule.** Develop a Schedule that provides dates for completing major operations of the Contract, including nonselective herbicide application, mowing, tilling, and seeding.

Submit the written Schedule at least 14 days before beginning operations. The Schedule will be reviewed by the Engineer and Landscape Operations Division for completeness and feasibility, and will be approved or returned for correction.

- (b) **IPM Program and Establishment Schedule.** Develop an IPM Program that includes methods of pest monitoring for weed control, pesticide selection, application rates, and scheduling. The Establishment Schedule shall include dates for meadow maintenance operations such as mowing.

Submit the IPM Program and Establishment Schedule when seeding operations are completed. The Program and Schedule will be forwarded to the Landscape Operations Division for review and comment before approval is granted.

707.03.03 Marking. Mark areas to be seeded, and obtain approval before applying herbicide, mowing, or beginning seeding operations.

707.03.04 Non-Selective Herbicide Application. Apply non-selective herbicide to eliminate undesirable vegetation when directed. Apply herbicide in water with wetting agent and dye in conformance with the IPM Program at least 10 days before seeding as follows:

NONSELECTIVE HERBICIDE APPLICATION	
MATERIAL	RATE PER ACRE
Glyphosate Herbicide	5 lb of active ingredient
Marking Dye	6 to 15 oz
Water	40 to 50 gal

707.03.05 Mowing. Mow vegetation to a height less than 4 in. before seeding when directed by the Engineer. Do not perform mowing within 10 days of non-selective herbicide application. Disperse or dispose of excessive clippings prior to seeding.

707.03.06 Preparing Soil Before Seeding.

- (a) **Broadcast Seeding.** Rototill the soil to a depth of 1 in. and remove stones and other debris with a length or width greater than 2-1/2 in. from the soil surface.
- (b) **Drill Seeding.** When using a drill seeder, no soil preparation is required.

707.03.07 Seed Delivery, Weighing, and Mixing.

- (a) **Delivery.** Seed shall be delivered unmixed.
- (b) **Weighing and Mixing.** Test seed as specified in 920.06.05 before weighing and mixing.

Use a scale with 0.01 oz accuracy to verify application rates and quantities of seed. Mix and apply seed separately or with other specified seed.

707.03.08 Application Rates. Apply materials as follows:

TABLE 1 - MEADOW ESTABLISHMENT APPLICATION RATES		
MATERIAL	LB PER 1000 FT²	LB PER ACRE
LIMESTONE	0 to 50 ^a	0 to 2,000 ^a
SULFUR	0 to 13 ^a	0 to 550 ^a
COMPOST	1.4 yd ³ Compost per 24 yd ³ of Topsoil ^a	
UPLAND MEADOW SEED	Refer to Table 2 Upland Meadow Seed	Refer to Table 2 Upland Meadow Seed
LOWLAND MEADOW SEED	Refer to Table 3 Lowland Meadow Seed	Refer to Table 3 Lowland Meadow Seed
WET MEADOW SEED	Refer to Table 4 Wet Meadow Seed	Refer to Table 4 Wet Meadow Seed
SHA SPECIAL PURPOSE SEED MIX Include with Upland & Lowland Meadow Seed	0.50	25
SEED CARRIER	2 to 6	85 to 260
FERTILIZER		
20-16-12 (83% UF with MAP & SOP)	9.2 ^a	400 ^a
38-0-0 (UF)	0 to 3.0 ^{a,b}	0 to 130 ^{a,b}
11-52-0 (MAP)	0 to 6.0 ^{a,b}	0 to 270 ^{a,b}
0-0-50 (SOP)	0 to 5.0 ^{a,b}	0 to 220 ^{a,b}
MULCH		
Straw Mulch	66	3000
Wood Cellulose Fiber Mulch Binder	23	1000

Note: UF = Ureaform MAP = Monoammonium Phosphate SOP = Sulfate of Potash

^a The NMP will specify the application rate.

^b When application of 20-16-12 is below 400 lb per acre, apply 38-0-0, 11-52-0, and 0-0-50 per NMP.

TABLE 2 - UPLAND MEADOW SEED					
FORBS	PURE LIVE SEED *		GRASSES	PURE LIVE SEED *	
	Oz per 1000 Ft²	Lb per Acre		Oz per 1000 Ft²	Lb per Acre
Select 8			Include All		
blackeyed Susan	0.18	0.5	Broomsedge	0.36	1.0
browneyed Susan	0.18	0.5	Deertongue	0.73	2.0
eastern purple coneflower	0.44	1.2	Little Bluestem	0.73	2.0
gray goldenrod	0.07	0.2	Purpletop	0.73	1.0
lanceleaf tickseed	0.51	1.4	Note: Seed Upland Meadow Seed with SHA Special Purpose Seed Mix * Seeding rates shall be calculated on the basis of Pure Live Seed per 1000 ft ² or acre.		
Maryland senna	0.11	0.3			
partridge pea	0.44	1.2			
smooth blue aster	0.07	0.2			
sundial lupine	0.51	1.4			
talus slope penstemon	0.07	0.2			
wild bergamot	0.07	0.2			

TABLE 3 - LOWLAND MEADOW SEED					
FORBS	PURE LIVE SEED *		GRASSES	PURE LIVE SEED *	
	Oz per 1000 Ft²	Lb per Acre		Oz per 1000 Ft²	Lb per Acre
Select 8			Include All		
common boneset	0.04	0.1	big bluestem	2.0	0.73
eastern purple coneflower	0.44	1.2	gamagrass	2.0	0.73
evening primrose	0.07	0.2	Indiangrass	2.0	0.73
lanceleaf tickseed	0.55	1.5	switchgrass	1.0	0.36
Maximilian sunflower	0.18	0.5	Note: Seed Lowland Meadow Seed with SHA Special Purpose Seed Mix * Seeding rates shall be calculated on the basis of Pure Live Seed per 1000 ft ² or acre.		
New England aster	0.07	0.2			
New York ironweed	0.07	0.2			
showy tickseed	0.04	0.1			
stiff goldenrod	0.11	0.3			
swamp verbena	0.26	0.7			
trumpetweed or spotted trumpetweed	0.07	0.2			

TABLE 4 - WET MEADOW SEED					
FORBS	PURE LIVE SEED *		GRASSES, SEDGES and RUSHES	PURE LIVE SEED *	
	Oz per 1000 Ft ²	Lb per Acre		Oz per 1000 Ft ²	Lb per Acre
Select 8			Include All		
Allegheny monkeyflower	0.07	0.2	common rush	0.29	0.8
crimsoneyed rose mallow	0.07	0.2	fox sedge	0.18	0.5
flat-top goldenrod	0.07	0.2	longhair sedge	0.11	0.3
king of the meadow	0.07	0.2	rattlesnake mannagrass	0.18	0.5
New York Aster	0.07	0.2	shallow sedge	0.11	0.3
New York Ironweed	0.07	0.2	woolgrass	0.11	0.3
seedbox	0.07	0.2	* Seeding rates shall be calculated on the basis of Pure Live Seed per 1000 ft ² or acre.		
swamp milkweed	0.04	0.1			
swamp sunflower	0.11	0.3			
swamp verbena	0.26	0.7			
trumpetweed or spotted trumpetweed	0.07	0.2			

707.03.09 Seeding Equipment. Use approved drill seeders equipped with 3 seed boxes, or broadcast seeders.

707.03.10 Seeding Methods. Operate seeders as follows:

- (a) **Drill Seeding.** Mix and place seed in the seed boxes A (small seed), B (medium seed), or C (fluffy seed) as recommended by the seeder manufacturer, or as specified or directed. Seed carrier may be mixed with seed.

Drill seed into the soil to a 1/4 in. depth. When soil is disturbed to a greater depth or is not in a firm condition at the time of seeding, firm the soil with a roller. Rollers shall weigh approximately 40 lb per ft of width.

- (b) **Broadcast Seeding.** Uniformly mix seed with seed carrier. Spread seed and carrier in two directions at right angles, and then lightly rake or drag seed into the soil to a 1/4 in. depth before firming the soil with a roller as described above.

707.03.11 Mulching. Immediately after seeding, apply mulch over bare soil to cover at least 90 percent of the surface. Do not apply mulch after operating a drill seeder through dead vegetation. Apply mulch as follows:

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(a) **Mulch Blower.** Apply mulch to a loose depth of 1/2 to 1-1/2 in.

(b) **By Hand.** Apply mulch to a loose depth of 1 to 2 in.

707.03.12 Securing Mulch. Secure mulch immediately after application by applying wood cellulose fiber uniformly without displacing the mulch.

707.03.13 Seeding Phase Acceptance. Submit a request for Seeding Phase Acceptance when operations are completed, and provide the IPM Program and Establishment Phase Schedule as specified in 707.03.02(a). Inspection will be conducted to verify completion. Seeding Phase Acceptance will be granted at that time.

707.03.14 Establishment Phase. The Establishment Phase begins upon Seeding Phase Acceptance as follows:

(a) **Period of Maintenance.** Maintain meadows for 12 months after seeding.

(b) **Weed Control.** Monitor and promptly implement the IPM Program to control weeds in conformance with the IPM Program, or when notified of problems in consultation with the Landscape Operations Division. Remove dead weeds over 18 in. tall.

(c) **Inspection.** Meadow establishment will be inspected by the Engineer on or about the 15th of January, March, May, July, September, and November.

707.03.15 Final Acceptance. The Engineer and the Landscape Operations Division will complete an Inspection Report of seedling height, color, and percent coverage. When it is not possible to perform the Inspection, Final Acceptance will be delayed until Inspection is possible.

The Inspection Report will be included in the Punch List requirements for the project. Complete the Punch List requirements as directed.

Final Acceptance will be granted when the seedlings have grown at least 4 in., exhibit dark green color, and percent coverage as follows:

MEADOW ESTABLISHMENT COVERAGE		
AREAS	SHA SPECIAL PURPOSE SEED MIX, SHA TEMPORARY SEED MIX, and MEADOW SEED	TOTAL VEGETATION COVER
	Seedling Coverage	
Areas flatter than 4:1; and slopes 4:1 and steeper not tracked with bulldozer	at least 70%	at least 95%
Slopes 4:1 and steeper tracked with bulldozer	at least 45%	at least 95%

707.03.16 Wildflower Seeding.

- (a) **Regional Areas.** Refer to 705.03.01(a).
- (b) **Seeding Seasons.** Refer to 707.03.01(b).
- (c) **Pesticide Application.** Refer to 710.03.01(c).
- (d) **Pesticide Application Reporting.** Refer to 710.03.01(d).
- (e) **Nutrient Management Plan (NMP).** Refer to 707.03.01(e).
- (f) **Nutrient Management Reporting.** Refer to 707.03.01(f).

707.03.17 Seeding Schedule. Develop a Schedule that provides dates for completing major operations of the Contract, including non-selective herbicide application and seeding.

Submit the proposed Schedule at least 14 days before beginning operations. The Schedule will be reviewed by the Engineer and Landscape Operations Division for completeness and feasibility, and will be approved or returned for correction.

707.03.18 Marking. Mark areas to be seeded, and obtain approval before applying herbicide, mowing, or beginning seeding operations.

707.03.19 Non-Selective Herbicide Application. Refer to 707.03.04.

707.03.20 Mowing. Refer to 707.03.05.

707.03.21 Seed Delivery, Weighing, and Mixing.

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(a) **Delivery.** Wildflower seed shall be delivered unmixed.

(b) **Weighing and Mixing.** Refer to 707.03.22 Table 6. Test seed as specified in 920.06.05 before weighing and mixing.

Weigh wildflower seed before uniformly pre-mixing and placing it into the seed boxes of the seeder. Use a scale with 0.01 oz accuracy to verify application rates and quantities of seed.

Mix and apply seed separately or with other specified seed.

707.03.22 Application Rates. Apply materials as follows:

TABLE 5 - WILDFLOWER SEEDING APPLICATION RATES		
MATERIAL	LB PER 1000 FT²	LB PER ACRE
LIMESTONE	0 to 50 ^a	0 to 2,000 ^a
SULFUR	0 to 13 ^a	0 to 550 ^a
COMPOST	0 to 1.4 yd ³ Compost per 24 yd ³ of Topsoil ^a	
WILDFLOWER SEED	Refer to Table 6 Wildflower Seed	Refer to Table 6 Wildflower Seed
SEED CARRIER	2 to 6	85 to 260
FERTILIZER		
20-16-12 (83% UF with MAP & SOP)	0 to 6.9 ^a	0 to 400 ^a
38-0-0 (UF)	0 to 3.0 ^b	0 to 130 ^b
11-52-0 (MAP)	0 to 6.0 ^b	0 to 270 ^b
0-0-50 (SOP)	0 to 5.0 ^b	0 to 220 ^b
MULCH		
Wood Cellulose Fiber Mulch Binder	23	1000

Note: UF = Ureaform MAP = Monoammonium Phosphate SOP = Sulfate of Potash

^a The NMP will specify the application rate.

^b When application of 20-16-12 is below 400 lb. per acre, apply 38-0-0, 11-52-0, and 0-0-50 per NMP.

TABLE 6 - WILDFLOWER SEED						
SPECIES	SMALL SEED		MEDIUM SEED		FLUFFY SEED	
	Oz per 1000 Ft ²	Lb per Acre	Oz per 1000 Ft ²	Lb per Acre	Oz per 1000 Ft ²	Lb per Acre
Include All (11)						
blackeyed Susan	0.18	0.5				
corn poppy	0.37	1.0				
golden tickseed	0.37	1.0				
lemon beebalm	0.18	0.5				
Moroccan toadflax	0.18	0.5				
Siberian wallflower	0.55	1.5				
doubtful knight's-spur			0.18	0.5		
garden comflower			0.37	1.0		
garden cosmos 'Sensation'			0.11	0.3		
sulphur cosmos 'Bright Lights'			0.11	0.3		
firewheel					0.18	0.50

707.03.23 Seeding Equipment. Use approved drill seeders equipped with 3 seed boxes.

707.03.24 Seeding Methods. Refer to 707.03.10(a).

707.03.25 Mulching and Securing Mulch. Refer to 707.03.11 and .12.

707.03.26 Seeding Phase Acceptance. Submit a request for Seeding Phase Acceptance when operations are completed. Inspection will be conducted to verify completion. Seeding Phase Acceptance will be granted at that time.

707.03.27 Establishment Phase. The Establishment Phase will begin upon Seeding Phase Acceptance.

707.03.28 Final Acceptance. The Engineer and the Landscape Operations Division will complete an Inspection Report of seedling color and percent coverage at 90 to 120 days after seeding. When it is not possible to perform the Inspection, Final Acceptance will be delayed until Inspection is possible.

The Inspection Report will be included in the Punch List requirements for the project. Complete the Punch List requirements as directed.

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Final Acceptance will be granted when the seedlings exhibit dark green color and percent coverage as follows:

WILDFLOWER SEEDING COVERAGE		
AREAS	WILDFLOWER SPECIES	TOTAL VEGETATION COVER
	Seedling Coverage	
Areas flatter than 4:1; and slopes 4:1 and steeper not tracked with bulldozer	at least 70%	at least 95%
Slopes 4:1 and steeper tracked with bulldozer	at least 45%	at least 95%

707.03.29 Mowing. Mow meadow or wildflower foliage to a height of 6 to 8 in. when directed by the Engineer in consultation with the Landscape Operations Division.

707.04 MEASUREMENT AND PAYMENT. Meadow Establishment and wildflower seeding will be measured and paid for at the Contract unit price for one or more of the specified items. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

707.04.01 Upland Meadow Establishment. Upland Meadow Establishment, including preparing soil, applying fertilizer, meadow seed, SHA Special Purpose Seed Mix, mulch, and securing mulch will be measured and paid for at the Contract unit price per square yard.

(a) Payment Schedule. Payments will be made according to the following Schedule when construction requirements are met:

MEADOW ESTABLISHMENT PAYMENT SCHEDULE			
CONSTRUCTION REQUIREMENTS		PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
707.03.01 thru .13	Seeding Phase and Seeding Acceptance	80	At Seeding Phase Acceptance
707.03.14 and .15	Establishment Phase Weed Control and Final Acceptance	20	Pro-Rated at Each Bi-Monthly Inspection and Final Acceptance
Total Payment		100%	

(b) Forfeiture. Failure to complete operations as required in conformance with the Payment Schedule will result in forfeiture of that percentage of payment.

707.04.02 Lowland Meadow Establishment. Lowland Meadow Establishment, including preparing soil, applying fertilizer, meadow seed, SHA Special Purpose Seed Mix, mulch, and securing mulch will be measured and paid for at the Contract unit price per square yard.

Payment Schedule. Refer to 707.04.01(a).

Forfeiture. Refer to 707.04.01(b).

707.04.03 Wet Meadow Establishment. Wet Meadow Establishment, including preparing soil, applying fertilizer, meadow seed, mulch, and securing mulch will be measured and paid for at the Contract unit price per square yard.

Payment Schedule. Refer to 707.04.01(a).

Forfeiture. Refer to 707.04.01(b).

707.04.04 Wildflower Seeding. Wildflower Seeding, including applying fertilizer, wildflower seed, and mulch will be measured and paid for at the Contract unit price per square yard. Payment will be made according to the Payment Schedule when construction requirements are met.

Payment Schedule. Payments will be made according to the following schedule when construction requirements are met:

WILDFLOWER SEEDING PAYMENT SCHEDULE			
CONSTRUCTION REQUIREMENTS		PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
707.03.16 thru .26	Seeding Phase and Seeding Acceptance	80	At Seeding Phase Acceptance
707.03.27 thru .28	Establishment Phase and Final Acceptance	20	At Final Acceptance
Total Payment		100%	

Forfeiture. Refer to 707.04.01(b).

707.04.05 Non Selective Herbicide Application per square yard.

707.04.06 Tractor and Hand Mowing per hour.

707.04.07 Selective Grass Herbicide Application per square yard.

707.04.08 Selective Broadleaf Herbicide Application per square yard.

707.04.09 Applying Limestone to Salvaged Topsoil and Nontopsoiled Areas per ton.

707.04.10 Applying Sulfur to Salvaged Topsoil and Nontopsoiled Areas per ton.

707.04.11 Applying Compost to Salvaged Topsoil and Nontopsoiled Areas per cubic yard.

707.04.12 Amending furnished topsoil and furnished subsoil will not be measured but the cost will be incidental to the Contract unit price for Placing Furnished Topsoil and Placing Furnished Subsoil.

SECTION 708 — TURFGRASS SOD ESTABLISHMENT

708.01 DESCRIPTION. Prepare soil and establish turfgrass sod.

708.02 MATERIALS.

Limestone	920.02.01
Sulfur	920.02.02
Gypsum	920.02.04
Compost	920.02.05
Fertilizer	920.03.01
Turfgrass Sod	920.04.06
Fasteners	920.05.02
Water	920.09.01

708.03 CONSTRUCTION.**708.03.01 General.**

- (a) **Regional Areas.** Refer to 705.03.01(a).
- (b) **Installing Season and Sod Species.** Install sod from August 15 to May 31 when the sod is not frozen.

Install tall fescue sod in Region 1 and Region 2. Install tall fescue or Bermudagrass sod in Region 3 as specified.

- (c) **Nutrient Management Plan (NMP).** Soil testing will be performed and a NMP will be developed by the Administration. Replace application rates of 708.03.05 as required by the NMP.

When a NMP is not available, 1000 lb. per acre of 20-16-12 (83% UF with MAP & SOP) fertilizer shall be the NMP rate for turfgrass establishment.

- (d) **Nutrient Management Reporting.** Record the fertilizer analysis, the square yards covered, and the pounds of fertilizer applied on the Nutrient Management Reporting Form. Submit the Form within 24 hours after applying fertilizer.

708.03.02 Grade Repair. Ensure that soil meets specified grades. Repair any gullies, washes, or disturbed areas that develop before preparing soil, incorporating soil amendments, or placing turfgrass sod.

708.03.03 Preparing Soil. Immediately before installing turfgrass sod, loosen the soil with rototillers, disks, rakes or other approved equipment to a depth of 3 in. Amendments may be incorporated into the soil during this operation.

When soil preparation is completed, remove clods, stones, and debris with a length or width greater than 1-1/2 in. and ensure the soil provides a uniform and porous surface, conforms to the specified grade, and is free of weed and plant growth.

708.03.04 Application Equipment. Use spreaders or other approved machinery that is calibrated before application. Apply materials accurately and uniformly to avoid misses and overlaps.

Operate spinner spreaders during non-windy weather. Do not allow materials to blow onto sensitive areas or structures.

708.03.05 Application Rates.

APPLICATION RATES		
MATERIAL	LB PER 1000 FT ²	LB PER ACRE
LIMESTONE	0 to 200 ^a	0 to 8700 ^a
SULFUR	0 to 30 ^a	0 to 1300 ^a
GYPSUM	0 to 92 ^a	0 to 4,000 ^a
COMPOST	0 to 1.4 yd ³ Compost per 24 yd ³ of Topsoil ^a	
FERTILIZER		
20-16-12 (83% UF with MAP & SOP)	23.0 ^a	1000 ^a
38-0-0 (UF)	0 to 9.2 ^{a,b}	0 to 400 ^{a,b}
0-0-50 (SOP)	0 to 5.7 ^{a,b}	0 to 250 ^{a,b}

Note: UF = Ureaform MAP = Monoammonium Phosphate SOP = Sulfate of Potash

^a The NMP will specify the application rate.

^b When application of 20-16-12 is below 1000 lb per acre, apply 38-0-0 and 0-0-50 per NMP.

708.03.06 Incorporating Soil Amendments. Mix soil amendments into the upper 3 in. of soil after application.

708.03.07 Transporting and Handling. Transport and install turfgrass sod within 48 hours after harvest. Handle sod without excessive breaking, tearing, or loss of soil.

708.03.08 Placing. Place turfgrass sod with closed joints. Do not overlap or leave gaps between strips.

(a) Slopes 2:1 and Steeper. Place sod strips with the long edges following the contour, not up and down the slope. Begin at the bottom of the slope and stagger the joints between strips.

(b) **Ditches.** Place sod strips with the long edges following the flow of water, not across the ditch. Center the lowest strip on the centerline of the ditch.

708.03.09 Securing. Secure turfgrass sod in ditches and slopes 2:1 and steeper with at least two fasteners per strip spaced no more than 2 ft apart. Drive the fasteners through the sod and firmly into the soil below so there is no gap at the top of the fastener.

708.03.10 Firming. Tamp or roll turfgrass sod after placing and stapling to tighten the joints between the sod strips, and to press the sod firmly into the soil. Hand tampers shall weigh approximately 15 lb with a flat surface of approximately 100 in². Rollers shall weigh approximately 40 lb per ft of width.

708.03.11 Initial Watering. Perform the first watering within four hours after placing turfgrass sod. Wet the soil to a depth at least 3 in. below the sod.

708.03.12 Installation Acceptance. Submit a request for Installation Phase Acceptance when operations are completed. Inspection will be conducted to verify completion. Installation Phase Acceptance will be granted at that time.

708.03.13 Establishment Phase. The Establishment Phase will begin upon Installation Phase Acceptance. Monitor the soil moisture and water needs of the sod. Promptly provide water when needed or when directed.

708.03.14 Final Acceptance. The Engineer and the Landscape Operations Division will complete an Inspection Report of turfgrass sod height, color, and coverage. When it is not possible to perform the Inspection, Final Acceptance will be delayed until Inspection is possible.

The Inspection Report will be included in the Punch List requirements for the project. Complete the Punch List requirements as directed.

Final Acceptance will be granted when the turfgrass sod has grown at least 4 in., exhibits dark green color, has at least 99 percent coverage, and is firmly rooted into the soil.

708.04 MEASUREMENT AND PAYMENT. Turfgrass Sod Establishment will be measured and paid for at the Contract unit price for

one or more of the specified items. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

708.04.01 Turfgrass Sod Establishment. Turfgrass Sod Establishment, including preparing soil, applying fertilizer, placing sod and fasteners, and initial watering will be measured and paid for at the Contract unit price per square yard.

(a) Payment Schedule. Payments will be made according to the following schedule when construction requirements are met:

PAYMENT SCHEDULE		
CONSTRUCTION REQUIREMENTS	PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
708.03 thru 708.03.12	80	At Installation Phase Acceptance
708.03.13 and 708.03.14	20	At Final Acceptance
Total Payment	100	

(b) Forfeiture. Failure to complete operations as required or directed in conformance with the Payment Schedule will result in forfeiture of that percentage of payment.

708.04.02 Applying Limestone to Salvaged Topsoil and Nontopsoiled Areas per ton.

708.04.03 Applying Sulfur to Salvaged Topsoil and Nontopsoiled Areas per ton.

708.04.04 Applying Gypsum to Salvaged Topsoil and Nontopsoiled Areas per ton.

708.04.05 Applying Compost to Salvaged Topsoil and Nontopsoiled Areas per cubic yard.

708.04.06 Amending furnished topsoil and furnished subsoil will not be measured but the cost will be incidental to the Contract unit price for Placing Furnished Topsoil and Placing Furnished Subsoil.

SECTION 709 — SOIL STABILIZATION MATTING

709.01 DESCRIPTION. Install soil stabilization matting (SSM) in conjunction with seeding.

709.02 MATERIALS.

Topsoil	920.01
Soil Stabilization Matting	920.05.01
Fasteners	920.05.02
Water	920.09.01

709.03 CONSTRUCTION.

709.03.01 Soil Preparation and Seeding. Perform operations for the SSM type as follows:

- (a) **Type A and B.** Prepare soil and perform Turfgrass Establishment as specified in Section 705, but do not apply mulch. Install SSM immediately after seeding as specified in 709.03.02 thru .05.
- (b) **Type C.** Install Type C SSM as specified in 709.03.02 thru .05. Infill with soil and immediately perform Turfgrass Establishment as specified in Section 705, but do not till or apply mulch. Complete matting installation over seeded area as specified in 709.03.06.
- (c) **Type D.** Prepare soil and perform seeding as specified. Install Type D SSM immediately after seeding as specified in 709.03.02 thru .05.

709.03.02 Unrolling. Unroll SSM in the direction of the flow of water. Lay matting smoothly in firm, uniform contact with the soil surface, without stretching or tenting.

709.03.03 Overlapping. Overlap SSM with the upslope portion on top. Overlap edges at least 2 in., and ends at least 6 in.

709.03.04 Keying-in. Keying-in consists of the following operations:

- (a) **Trenching.** Trench into the soil perpendicular to the flow of water to at least 6 in. depth.

AREAS OF MATTING TO KEY-IN	
MATTING TYPE	AREA OF MATTING
A, B	Uppermost or leading-edge.
A, B	Edges adjacent to catch basins and structures.
B	Lowermost or toe-edge.
C, D	All edges
C	Folds of matting perpendicular to water flow every 20-25 ft.

- (b) **Fastening.** Install fasteners through SSM into the bottom of the trench.

- (c) **Backfilling.** Backfill the trench with firmly tamped soil.

709.03.05 Fastening. Refer to 920.05.02 and secure SSM with fasteners driven perpendicular to the soil grade, and flush with the surface of the matting as follows:

- (a) **Fastener Selection.** Use fasteners of the shape and length approved for the matting type as follows:

FASTENER SELECTION					
MATTING TYPE	FASTENER SHAPE	APPROVED FASTENERS			
		6 in. Length	8 in. Length	12 in. Length	18 in. Length
A	U-Shaped Staple	X	X		
	Circle-Top Pin	X	X		
	Round Head Pin	X	X		
	T-Head Pin	X			
	Wood Peg	X			
B, C, D	U-Shaped Staple		X	X	
	Fabric Pin			X	X

- (b) **Placement of Fasteners.** Install fasteners at the specified distance apart as required for the area of matting and the matting type as follows:

FASTENER PLACEMENT		
AREA OF MATTING	MATTING TYPE	MAXIMUM DISTANCE BETWEEN FASTENERS In.
Uppermost or Leading-Edge of Matting	A, B, C, D	6
Overlapping Edges of Matting	A, B, C, D	18
Center of Ditch	A, B, C, D	18
Lowermost or Toe-Edge of Matting	A, B, C, D	18
Throughout Matting	A, B, C, D	24
In Folds Every 20 to 25 ft	C	12

709.03.06 Infilling and Seeding Type C SSM. Perform the following operations after installing Type C SSM.

- (a) **Infilling.** Infill the matting with topsoil to provide a depth equal to twice the thickness of the matting, and sufficient for a graded 24 in. tapered area beyond the outside edges of the matting.
- (b) **Seeding.** Firm the soil with a roller as specified in 708.03.10 and perform Turfgrass Establishment over the infilled matting and tapered area.
- (c) **Covering.** Install Type B SSM immediately after seeding to cover the seeded area. Secure the matting with 12 in. U-shaped staples, or 12 in. or 18 in. fabric pins.

709.03.07 Watering. Gently water SSM with a sprinkler or water-breaker nozzle within 48 hours of installation to bond the matting to the soil. Apply water at the rate of 300 gal per 1000 ft² to wet the soil to a minimum 2 in. depth below the matting.

709.03.08 Installation Phase Acceptance. Inspection will be conducted to verify that operations were completed as specified. Installation Phase Acceptance will be granted at that time.

709.03.09 Establishment Phase. The Establishment Phase will begin upon Installation Phase Acceptance.

709.03.10 Final Acceptance. Final Acceptance will be granted when the SSM is secure and the turfgrass or other vegetation seedlings have grown at least 4 in., exhibit dark green color and minimum percent coverage.

Turfgrass establishment will be accepted as specified in 705.03.14. Other vegetation seeding will be accepted as specified.

When turfgrass establishment or other vegetation seeding is not acceptable, remove Type A, B, or D SSM. Remove Type C matting when directed.

Prepare soil, reseed, and install new matting unless the original matting is approved for reuse. Apply additional fertilizer or soil amendments as directed.

709.04 MEASUREMENT AND PAYMENT. Soil stabilization matting will be measured and paid for at the Contract unit price per square yard for one or more of the specified items. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

(a) Payment Schedule. Payments will be made according to the following schedule when construction requirements are met:

PAYMENT SCHEDULE		
CONSTRUCTION REQUIREMENTS	PERCENT OF TOTAL CONTRACT PRICE	PAYMENT FOR COMPLETED WORK
709.03.01 thru .08	80	At Installation Phase Acceptance
709.03.09 and .10	20	At Final Acceptance
Total Payment	100	

(b) Forfeiture. Failure to complete operations as required in accordance with the Payment Schedule will result in forfeiture of that percentage of payment.

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 Type C Soil Stabilization Matting per square yard.

709.04.04 Type D Soil Stabilization Matting per square yard.