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1.1 Function of Subsoil Preparation and Basis of Work The specifications of Section 1 shall apply only to sites where topsoil will be deposited and spread over existing or disturbed subsoil (Section 2) in preparation for turfgrass seeding (Section 3). Subsoil preparation operations shall be completed before topsoil is deposited or spread; turfgrass shall not be directly seeded into subsoil. All labor, equipment, and materials required for the completion of Section 1 shall be furnished by the seeding contractor, unless specified otherwise.

1.2 Subsoil Definition Subsoil shall be defined to be any or all of the natural soil layers of the site, or any soil which meets the specifications of Section 1.2, or any soil of a composition and depth specified and approved by all affected parties. Unless otherwise specified, subsoil shall contain a maximum volume of 25% of rocks or other materials larger than 0.25 inches in diameter, and shall contain no rocks or other materials larger than 5.0 inches in diameter. The depth of the subsoil layer that lies upon rock or other materials which do not themselves constitute subsoil shall be at least 6.0 inches deep. When the subsoil layer is less than 6.0 inches deep, either topsoil or additional subsoil shall be moved to the site and spread in a layer so that the base of subsoil upon which the final topsoil layer will be spread is at least 6.0 inches deep. Subsoil shall not contain any chemicals or other materials in concentrations which may be toxic to the growth of turfgrass seedlings.

1.3a Subsoil Testing Requirements A representative subsoil sample taken to a depth of 4.0 inches shall be submitted to an accredited soil testing laboratory for analysis to determine its acidity (pH), soluble salts concentration, and fertility levels of phosphorus (P₂O₅) and potassium (K₂O). If, because of contractual obligations or other compelling reasons, there is insufficient time to conduct and evaluate subsoil test results before topsoil is deposited and spread, a subsoil sample shall be collected and subsoil tests shall be conducted and evaluated as soon as possible thereafter. All parties that may be affected by subsoil conditions which may adversely influence the success of turfgrass seeding shall be promptly notified by the seeding contractor of the results of such soil tests. Refer to Section 14.8 for a list of regional soil testing laboratories that serve Maryland.

1.3b Subsoil Acidity (pH) Subsoil shall be tested for acidity (pH), and except as allowed in Section 1.3a for contractual obligations or other compelling reasons, topsoil shall not be deposited or spread over subsoil with acidity below pH 5.5 or above pH 7.5. Subsoil with pH 6.5 is ideal. When subsoil acidity is not within pH 5.5 to pH 7.5, modifications to correct subsoil pH shall be made according to the recommendations of the soil test lab, or of the Maryland Cooperative Extension, or by using Table A or B as follows: When subsoil acidity is below pH 5.5, see Table A and add the amount of limestone specified to correct subsoil acidity to pH 6.5. When subsoil acidity is above pH 7.5 see Table B and add the amount of elemental sulfur specified to correct subsoil acidity to pH 6.5. Section 6.3 and Section 6.4 provide specifications and additional information about limestone and elemental sulfur which shall apply to the performance of Section 1.3b.

Table A
Pounds of Limestone to Add per 1000 ft² to
Correct Subsoil Acidity to pH 6.5

Original pH	Soil Texture Class		
	Sand	Loam	Clay
4.8	85	140	200
5.0	75	125	175
5.2	65	110	150
5.4	55	95	125
5.6	45	80	100
5.8	35	65	80
6.0	25	50	60
6.2	15	35	40
6.4	5	15	20

Note: Table A shall be used for limestone applied according to Sections 1.3b and 4.3

Table B
Pounds of Elemental Sulfur to Add per 1000 ft² to
Correct Subsoil Acidity to pH 6.5

Original pH	Soil Texture	
	Sandy Soil	Clay Soil
7.5	10-15	20-25
8.0	25-35	35-50
8.5	35-50	40-50

Note: Table B shall be used for elemental sulfur applied according to Sections 1.3b and 4.4

1.3c Subsoil Soluble Salts Subsoil shall be tested for soluble salts concentration, and except as allowed in Section 1.3a for contractual obligations or other compelling reasons, topsoil shall not be deposited or spread over subsoil when its soluble salts concentration exceeds 500 parts per million (ppm) by weight or 4.0 millisiemens per centimeter (ms/cm) by electrical conductivity. Modifications to reduce subsoil soluble salts shall be made according to the recommendations of the soil test lab, or of the Maryland Cooperative Extension, or Table C as follows: When soluble salts exceed 500 ppm or 4.0 ms/cm, add the amount of gypsum specified to reduce soluble salts to recommended levels. Section 6.5 provides specifications and information about gypsum which shall apply to the performance of Section 1.3c.

Table C
Pounds of Gypsum to Add per 1000 ft² to
Reduce Soluble Salts to Recommended Levels

Original Salts Level millisiemens	parts per million (ppm)	Pounds Gypsum per 1000 ft ²
8	2500	320
7	1800	230
6	1250	160
5	700	80
4.5	550	40

Note: Table C shall be used for gypsum applied according to Sections 1.3c and 4.5

1.3d Subsoil Phosphorus and Potassium Subsoil shall be tested for phosphorus (P₂O₅) and potassium (K₂O). Except as allowed in Section 1.3a for contractual obligations or other compelling reasons, topsoil shall not be deposited or spread over subsoil which is deficient in phosphorus or potassium. Fertility recommendations for the site based on turfgrass requirements for phosphorus and potassium shall be obtained from the soil testing laboratory or the Maryland Cooperative Extension, and subsoil levels of these nutrients shall be adjusted with fertilizer to conform with the recommendations.

Table D Maximum Fertilizer Applications According to Maryland Nutrient Management Guidelines

Fertilizer Analysis	Maximum Application Lbs.		N Yield Lbs.		P ₂ O ₅ Yield Lbs.		K ₂ O Yield Lbs.	
	Acre	1000 ft ²	Acre	1000 ft ²	Acre	1000 ft ²	Acre	1000 ft ²
10 - 20 - 20 with 100% Soluble N	436	10.0	43.6	1.0	87.1	2.0	87.1	2.0
10-22- 22 with 50% UF	396	9.1	39.6	0.9	87.1	2.0	87.1	2.0
18 -18 -18 with 100% Sol N	242	5.6	43.6	1.0	43.6	1.0	43.6	1.0
with 50% SCU or UF)	484	11.1	87.1	2.0	87.1	2.0	87.1	2.0
18 -24 -12 with 50% SCU	363	8.3	65.3	1.5	87.1	2.0	43.6	0.5
19 -19 -19 with 100% Soluble N	229	5.3	43.6	1.0	43.6	1.0	43.6	1.0
with 50% SCU	458	10.5	87.1	2.0	87.1	2.0	43.6	2.0

Note: All fertilizer applications shall conform to Maryland Nutrient Management Regulations

1.4 Subsoil Grading Subsoil areas which are intended to receive topsoil shall be maintained on a true and even grade, in compliance with architectural drawings and/or other applicable specifications pertaining to the site, with no significant depressions or elevations. Topsoil shall not be deposited or spread over the subsoil until rough grading has been completed and all areas within the subgrade are within 2/10 of 1.0 foot (2.5 inches per foot) from the final subgrade. If the graded area develops weed or other plant growth, the plants shall be eliminated before topsoil is deposited or spread over the subsoil.

1.5 Subsoil Tilling After the subsoil has been graded according to the specifications of Section 1.4 the surface of the subsoil shall be loosened by disking, tilling, or scarifying with rototillers, disk harrows, chisel plows, rippers, or other suitable soil preparation equipment. Where the slope of the site is shallower than 3:1 slope, the surface of the subsoil shall be loosened to a minimum average depth of 2.0 inches. In sites where the slope is 3:1 or steeper, the subsoil shall be loosened to a depth of 0.5 to 1.0 inches. The surface of the subsoil shall be loosened immediately before topsoil is deposited or spread over the site.

1.6 Site Clean Up Grading stakes, stones, trash, and other debris which may hinder the distribution of topsoil, fertilizer, compost, limestone, etc., during topsoil preparation, shall be removed from the site when subsoil preparation operations are completed. Soil, fertilizer, compost, limestone, sulfur, and gypsum shall be removed from paved areas as soon as possible after subsoil loosening operations are completed. Clean up shall be completed by the seeding contractor before acceptance is given.

1.7a Materials Acceptance The seeding contractor shall inform all affected parties of the composition of the fertilizer, compost, limestone, sulfur, and gypsum that are intended for application at the site before any of these materials are applied; acknowledgment of acceptance of these materials shall be given by the owner, general contractor, landscape architect, or other person(s) authorized to make such a decision before spreading operations are begun. Labels and other material identification pertaining to the materials that are applied shall be retained by the seeding contractor for a minimum of 90 days after the completion of spreading operations.

1.7b Performance Acceptance The site shall be inspected within 24 hours of the completion of each subsection of Section 1, as indicated by the seeding contractor. Acknowledgment of acceptable performance shall be given by the owner, general contractor, landscape architect, or other person authorized to inspect the site. The seeding contractor shall give notification when all subsections of Section 1 have been completed; final acceptance and payment shall be made within 24 hours of such notification, or within the time period specified in the contract.

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1.8 Professional Guarantee The seeding contractor shall guarantee that the materials and methods selected and used shall be appropriate for the site and its intended use, according to the specifications of Section 1, unless specified otherwise. The seeding contractor shall guarantee that a subsoil layer of thickness and composition required according to the specifications of Section 1.2 shall be prepared and made ready for topsoil deposition (Section 2) according to the specifications of Sections 1.3, 1.4, and 1.5. The seeding contractor shall guarantee that testing for subsoil acidity (pH), soluble salts, phosphorus, and potassium shall be performed, and that measures to correct subsoil acidity, soluble salts, and nutrient deficiencies shall obtain the requirements specified in Section 1.3 before topsoil is deposited or spread.

1.9a Site Protection It shall be the responsibility of the owner, general contractor, or other authorized party to install signs, flagging, etc. at the perimeter of the subsoil preparation site which shall serve to notify foot and vehicular traffic that a sensitive area may be damaged by their entry. Under no circumstances shall the seeding contractor be held liable to repair a subsoil preparation site that is damaged by the entry of such traffic.

1.9b Erosion Protection and Repair It shall be the responsibility of the seeding contractor to ensure that soil and other materials applied according to the specifications of Section 1 are not blown or washed from the site, and that nearby areas and streams are protected from soil, fertilizer, compost, etc. In the event of heavy rain or wind that causes damage to the site which may have been anticipated and prevented by the seeding contractor, then the seeding contractor shall repair the damaged areas so they are restored to a condition acceptable under the specifications of Section 1; when soil or other material is moved from the site and deposited on nearby areas, the seeding contractor shall restore those areas to a condition substantially similar to that which prevailed before the damaging event.

1.9c Repair Limitations The seeding contractor shall not be obliged to repair the site or nearby areas when damage to them was substantially caused by water, soil, or other materials which passed into the site from an area not stabilized or under the supervision of the seeding contractor. Examples of situations which shall void the responsibility of the seeding contractor to repair the site and nearby areas shall include the failure of responsible parties to provide effective groundcover, spillways, drainage diversions, water settlements, silt fence, etc., which would have prevented the damage.

1.9d Damages Disclaimer The seeding contractor shall not be held liable to repair damages incurred to the site as a result of materials not applied under the supervision of the seeding contractor, nor by vandalism, nor by acts of God. The seeding contractor shall not be held liable to repair or otherwise amend the site as a result of the use of topsoil, fertilizer, compost, or soil amendments which are labeled in error or which are otherwise not in accordance with the label or description provided with them by the manufacturer or distributor of the products, when they are applied by the seeding contractor in good faith, in accordance with their label or description.

1.9e Hazards Disclaimer Because the subsoil preparation site is a construction zone not under the ownership or legal control of the seeding contractor it may present hazards to persons or property which enter the site. The seeding contractor specifically disclaims any and all responsibility for the safety and security of persons or property which may enter the site before the seeding contractor has begun work or when work is underway or at any time after work has been completed, and without regard to whether such entry is legal or otherwise. The seeding contractor shall assume no responsibility for personal injury or property damage, nor be subject to any claims of negligence, when the seeding contractor has performed work according to the specifications of MSA-GS-05.0, as mutually agreed, or has applied products or materials according to the recommendations of their manufacturer or distributor.

1.10 Payment The seeding contractor shall give notification upon the completion of Section 1; the work site shall be inspected within 24 hours of such notification, and payment shall be made at that time, or as specified in the contract. When payment is not received within the specified time period, the seeding contractor may void any guarantees related to Section 1, and may seek appropriate legal remedies.