

SECTION 32 9200

LAWNS AND GRASSES

PART 1 GENERAL

1.00 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.01 WORK INCLUDED

- A. Provide all materials and equipment, and do all work required to complete the seeding including furnishing and placing planting soil, as indicated on the Drawings and as specified.
1. Any landscape area disturbed by Contractor and not showing specific proposed planting treatment, shall be loamed and seeded as specified herein at no additional cost to the Owner.

1.02 RELATED WORK

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
1. Section 31 23 00, SITE EXCAVATING, BACKFILLING AND COMPACTING; Excavation and backfill and establishment of subgrade elevations.
 4. Section 32 93 00, TREES, PLANTS, AND GROUND COVERS; New plantings.

1.03 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
1. American Society for Testing and Materials (ASTM):

C 136	Sieve Analysis of Fine and Coarse Aggregates
D 422	Particle-Size Analysis of Soils
E 11	Wire-Cloth Sieves for Testing Purposes

1.04 SUBMITTALS

- A. Samples: The following samples shall be submitted:
- | <u>Material</u> | <u>Quantity (lb.)</u> |
|-----------------|-----------------------|
|-----------------|-----------------------|
- B. Manufacturer's Product Data: Manufacturer's product data shall be submitted for the following materials:

Aluminum sulfate
Lime
Seed
Loam borrow
Fertilizer

- C. Certificates: Labels from the manufacturer's container certifying that the product meets the specified requirements shall be submitted for the following materials:

Commercial fertilizer
Grass seed
Ground limestone
Seed mix for sod

- D. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of lawns during a calendar year. Submit before expiration of required maintenance periods.

1.05 OWNER'S INSPECTION AND TESTING

- A. Work will be subject to inspection at all times by the Architect. The Owner reserves the right to engage an independent testing laboratory in accordance with requirements of 01 45 00, QUALITY CONTROL to analyze and test materials used in the construction of the work. Where directed by the Architect, the testing laboratory will make material analyses and will report to the Architect whether materials conform to the requirements of this specification.
1. Cost of tests and material analyses made by the testing laboratory will be borne by the Owner when they indicate compliance with the specification, and by the Contractor when they indicate non-compliance.
 2. Testing equipment will be provided by and tests performed by the testing laboratory. Upon request by the Architect, shall provide such auxiliary personnel and services needed to accomplish the testing work.
 3. Gradation of granular materials shall be determined in accordance with ASTM C 136. Sieves for determining material gradation shall be as described in ASTM E 11.

1.06 CONTRACTOR'S INSPECTION AND TESTING

- A. The Contractor shall engage an independent testing agency, experienced in the testing of agricultural soils and acceptable to the Architect, to perform the topsoil/planting soil tests and analyses specified herein. All costs associated with testing shall be the Contractor's responsibility.

1. Particle size analysis shall include the following gradient of mineral content:

<u>USDA Designation</u>	<u>Size in mm</u>
Gravel	+ 2 mm
Very coarse sand	1-2 mm
Coarse sand	0.5-1 mm
Medium sand	0.25-0.5 mm
Fine sand	0.1-0.25 mm
Very fine sand	0.05-0.1 mm
Silt	0.002-0.05 mm
Clay	< 0.002 mm

2. Chemical analysis shall include the following:

- a. pH and buffer pH
- b. percentage of organic content by oven-dried weight
- c. Nutrient levels by parts per million, including phosphorus, potassium, magnesium, manganese, iron, zinc, and calcium. Nutrient test shall include testing laboratory recommendations for supplemental additions to the soil, if necessary, based on the requirements for ornamental horticultural plants. Recommendations shall include rates at which additives are to be applied.
- d. Soluble salt by electrical conductivity of a 1:2 soil/water sample.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver seed in original sealed containers, labeled with analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging, location of packaging, and name of seed grower. Damaged packages will not be accepted.
- B. Seed shall be stored under cool and dry conditions so that the endophytic seed in the mixture is capable of maintaining a high level of endophytes
- C. Deliver fertilizer in sealed waterproof bags, printed with manufacturer's name, weight, and guaranteed analysis.

1.08 PLANTING SEASON

- A. Planting season shall be as follows:

<u>Material</u>	<u>Planting Season</u>	
	<u>Spring</u>	<u>Fall</u>
Seeding	3/15 to 4/15	8/15 to 9/15

- B. Planting shall only be performed when weather and soil conditions are suitable for planting the material specified in accordance with locally accepted practice.
- C. Planting season may be extended with the written permission of the Architect.

1.09 ACCEPTANCE

- A. Acceptance:
 - 1. The Architect will inspect all work for Substantial Completion upon written request of the Contractor. The request shall be received at least ten calendar days before the anticipated date of inspection.
 - 2. Acceptance of material by the Architect will be for general conformance to specified requirements, and shall not relieve the Contractor of responsibility for full conformance to the Contract Documents.
 - 3. Upon completion and reinspection of all repairs or renewals necessary in the judgement of the Architect, the Architect will recommend to the Owner that the work of this Section be accepted.
- B. Seed areas will be accepted when in compliance with all the following conditions:
 - 1. All areas show a uniform stand of specified grass in healthy condition.
 - 2. At least 60 days have elapsed since the completion of work under this Section.

1.10 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.
 - 1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
 - 2. Experience: Five years' experience in landscape installation in addition to requirements in Division 01 Section "Quality Requirements."
 - 3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
- B. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
 - 1. Certified Landscape Technician - Exterior, with installation and/or maintenance specialty area(s), designated CLT-Exterior.
 - 2. Certified Landscape Technician - Interior, designated CLT-Interior.
 - 3. Certified Ornamental Landscape Professional, designated COLP.
- C. Pesticide Applicator: State licensed, commercial.
- D. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

PART 2 PRODUCTS

2.01 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed mixture: Standard grade seed of the most recent season's crop. Seed shall be dry and free of mold. Where possible, seed shall be inoculated with endophytes. Seed mixture shall be as follows:
- C. Seed mix shall be 100% Penn State Mix:
 - Line drive II Perennial ryegrass 49.16%
 - creeping red fescue 29.24%
 - Kentucky bluegrass 18.06%
 - Inert 3.02%
 - Other crop .51%
 - Weed seed .01%

2.02 PLANTING SOIL

- A. Existing Topsoil
 - 1. Existing topsoil from on-site source(s) may be used for planting soil, to the extent available, if it meets the requirements of this Section for planting soil, or if approved by the Architect.
- B. Planting Soil

1. Planting soil shall be composed of a natural, fertile, friable soil typical of cultivated topsoils of the locality, suitable for the germination of seeds and support of vegetative growth, with additives, if required, to achieve particle distribution and organic content specifications. Topsoil shall be taken from a well-drained, arable site, free of subsoil, large stones, earth clods, sticks, stumps, clay lumps, roots, other objectionable, extraneous matter or debris nor contain toxic substances. Planting soil shall have a pH value between 5.5 and 6.5 and organic matter content of 5 to 10% of total dry weight.
2. Planting soil shall have the following mechanical analysis (see paragraph 1.06 for particle sizes):

Approximate Particle Distribution

Gravel	Less than 10%
Coarse to medium sand	55 – 65%
Fine to very fine sand	15 – 25%
Silt	10– 20%
Clay	15 – 20%

3. Minimum planting soil nutrient levels shall be: Nitrogen @ 5% average of organic matter, Phosphorus @ .02 to .05% average of total soil content, Potassium @ 1.2% average of total soil content.
4. The Contractor shall provide the Architect with planting soil test results, as specified in Paragraph 1.05, before the start of planting operations. If planting soil does not fall within the required particle distribution, organic content, or pH range, it shall be adjusted to meet the specifications through the addition of sand, compost, limestone, or aluminum sulfate to bring it within the specified limits.

2.03 COMPOST (Planting Soil Amendment)

- A. Compost shall be derived from organic wastes such as food and agricultural residues, animal manures, mixed solid waste and biosolids (treated sewage sludge) that meet all State Environmental Agency requirements. The product shall be well composted, free of viable weed seeds and contain material of a generally humus nature capable of sustaining growth of vegetation, with no materials toxic to plant growth.

1. Compost shall have the following properties:

<u>Parameters</u>	<u>Range</u>
pH	5.5 – 8.0
Moisture Content	35% - 55%
Soluble Salts	≤ 4.0 mmhos (dS)
C:N ratio	15 – 30:1
Particle Size	< 1"
Organic Matter Content	> 50%
Bulk Density	< 1000 lbs./cubic yard
Foreign Matter	< 1% (dry weight)

2. Compost generator shall also provide minimum available nitrogen and other macro and micro nutrients to determine fertilizer requirements.
3. Compost shall be "AllGro", distributed by AllGro, 4 Liberty Lane West, Hampton, NH 03842; "Agresoil", distributed by Agresource, 100 Main Street, Amesbury, MA 01913; or approved equal.
4. Guidelines for quantity of compost required to achieve suitable soil organic content in soil mixes for ornamental horticultural planting shall be as recommended by the compost manufacturer.

2.04 PEAT MOSS

- A. Peat moss shall be a horticultural grade, sphagnum peat moss containing partially decomposed fibrous or cellular stems and leaves of any of the many species of sphagnum mosses from fresh water sources conforming to the following requirements:
1. Peat moss shall be a homogenous material free of decomposed colloidal residue lumps, roots, stones, and other foreign matter; and of such consistency that peat can be pass a 1/2 in. mesh and can be readily incorporated with the topsoil.
 2. The pH shall not be less than 3.5 nor greater than 6.0 at 25 degrees C.
 3. Organic matter content shall be not less than 90%, by weight, on an oven-dry basis.
 4. Ash content shall not be more than 10%, by weight, on an oven-dry basis.
 5. Moisture absorption capacity shall not be less than 800%, by weight, on an oven-dry basis.

2.05 LIMESTONE

- A. Lime shall be an approved agricultural limestone containing no less than 50% of total carbonates, and 25% total magnesium with a neutralizing value of at least 100%. The material shall be ground to such a fineness that 40% will pass through a No. 100 U.S. Standard Sieve, and 98% will pass through a No. 20 U.S. Standard Sieve. The lime shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original unopened containers, each bearing the manufacturer's guaranteed analysis. Any lime which becomes caked or otherwise damaged making it unsuitable for use, will be rejected.

2.06 WATER

- A. Water shall be suitable for irrigation and free from ingredients harmful to seeded or sodded areas.

2.07 ALUMINUM SULFATE

- A. Aluminum sulfate shall be unadulterated and shall be delivered in containers with the name of the material and manufacturer, and net weight of contents.

2.08 COMMERCIAL FERTILIZER

- A. Starter fertilizer shall be HD Scotts Starter Fertilizer or approved equal.
- B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
1. Composition (When applied as a topsoil amendment): Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency. Manufacturer's literature shall be submitted for approval.
- C. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- D. When used as a top dressing for the maintenance of sod, fertilizer shall conform to the following:

<u>Constituent</u>	<u>% Present by Weight</u>
Nitrogen (N)	10
Phosphorous (P)	8
Potassium (K)	4

- a. 50% of nitrogen shall be derived from natural organic source of ureaform.
- b. Available phosphorus shall be derived from superphosphate, bone meal, or tankage.
- c. Potassium shall be derived from muriate of potash containing 60% potash.

- E. Fertilizer shall be delivered in manufacturer's standard container printed with manufacturer's name, material weight, and guaranteed analysis.
- F. Fertilizers with N-P-K analysis other than that stated above may be used provided that the application rate per square foot of nitrogen, phosphorus, and potassium is equal to that specified.

2.09 SUPERPHOSPHATE

- A. Superphosphate shall be composed of finely ground phosphate rock as commonly used for agricultural purposes, and containing not less than 20% available phosphoric acid. The superphosphate shall be delivered to the site in the original unopened containers, each bearing the manufacturer's guaranteed analysis. Any superphosphate which becomes caked or otherwise damaged making it unsuitable for use, will be rejected.

2.10 MULCHES

- A. Cellulose fiber mulch shall be composed of 100% Thermally Refined wood fiber with the highest quality cellulose, delivering up to 15% greater yield, contain a green color additive, be weed free, and non-polluting, containing no germination or growth - inhibiting factors, similar to Conwed Fibers EnviroBlend with TriFlo, manufactured by Conwed Fibers, Profile Products LLC, 750 Lake Cook Rd, Suite 440, Buffalo Grove, IL 60089; Phone: 800-207-6457; Fax: 847-215-0577.
- B. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- C. Peat Mulch: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.
- D. Peat Mulch: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.

2.11 EDGING

- A. Steel edging shall be Border Concepts Edging, "Border King", manufactured by Border Concepts, Inc., P.O. Box 471185, Charlotte, NC 28247 or approved equal. Steel edging shall be shop fabricated, primed and painted black.
 1. Steel edging shall have slotted holes for staking steel edging every 30 in. o.c.
 2. Steel stakes shall be 15 in. long, tapered.
 3. Provide manufacturer's end stake and splicer unit.
 4. Provide manufacturer's optional preformed tree rings and tree squares as indicated on the Drawings.

5. Provide manufacturer's standard touch-up paint for in field touch-up of scratched or marred areas.

2.12 FILTER FABRIC

- A. Filter fabric shall be a non-woven polypropylene fabric made specifically for use in subsurface drainage structures equal to Mirafi 140N, manufactured by Tencate Geosynthetics, 365 South Holland Drive, Pendergrass, GA 30567; Tel 800 685 9990; Tel 706 693 2226; Fax 706 693 4400; www.mirafi.com, or approved equal.

2.13 SOIL STABILIZATION FABRIC

- A. Soil stabilization fabric shall be "Enkamat 7010", three dimensional geomatrix of heavy nylon filaments fused at their intersections with 95% open space available for soil and root interaction with filaments, manufactured by Akzo Nobel Geosynthetics Company, Asheville, NC 28802, or approved equal.
- B. Staple for anchoring erosion control netting shall be No. 8 gage steel wire, bent U-shaped, with throat width of 1 to 2 in. and effective driving depth not less than 8 in.

2.14 WEED CONTROL

- A. Weed control for stockpiled topsoil shall be a non-selective weed killer for control of grassy and broadleaf weeds; weed control shall have short residual, allowing seeding or sodding operations to occur within 7 days of application.

PART 3 EXECUTION

3.01 PREPARATION OF SUBGRADE

- A. Subgrade shall be examined to ensure that rough grading and all other subsurface work in lawn areas and other areas to be seeded is done prior to start of seeding and sodding.
- B. Limit subgrade preparation to areas that will be planted in the immediate future.
- C. Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous materials.
- D. Preparation of Unchanged Grades: Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:

3.02 SPREADING OF PLANTING SOIL

- A. Planting soil shall not be spread and fine graded until it is possible for Architect to inspect within 48 hours and for areas to be seeded within 48 hours of Architect approval. Areas that must be seeded later than 48 hours following Architect approval shall only be done so with Architect written approval.
- B. Planting soil shall not be placed when subgrade or topsoil material are frozen, excessively wet, or excessively dry.

- C. Planting soil shall be spread in a uniform layer, to a thickness which will compact to the depth required to bring final lawn and grass surfaces to required elevation. Unless otherwise indicated, minimum depth of topsoil for sodded areas shall be 6 in., and minimum depth of topsoil for seeded areas shall be 8 in.
 - 1. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
- D. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1-1/2 inches (38 mm) in any dimension, and other objects that may interfere with planting or maintenance operations. Refer to Section 329119, LANDSCAPE GRADING.
- E. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

3.03 APPLICATION OF FERTILIZER AND CONDITIONERS

- A. Fertilizer and conditioners shall be applied at the following rates:
 - 1. Peat moss - as required by test results of topsoil..
 - 2. Limestone - as required by test results of topsoil.
 - 3. Fertilizer - as required by test results of topsoil.
- B. Mixing with topsoil:
 - 1. Fertilizer and conditioners shall be spread over the entire lawn areas at the application rates indicated above.
 - 2. Materials shall be uniformly and thoroughly mixed into the top 4 in. of topsoil by discing, rototilling, or other approved method.

3.04 FINISH GRADING

- A. Contractor shall set grade lines for Landscape Architect's review and approval.
 - 1. Final surface of topsoil immediately before seeding and sodding shall be within $\pm 1/2$ in. of required elevation, with no ruts, mounds, ridges, or other faults, and no pockets or low spots in which water can collect. Stones, roots, and other debris greater than 1 in. in any dimension, which are visible at the surface, shall be removed and the resulting holes filled with topsoil, leaving a uniform planar surface.
- B. Finish grade surface with a drag or rake. Smooth down all lumps and ridges, fill in all holes and crevices. Rolling with a light roller is acceptable, if the surface is scarified afterward.
 - 1. Grade Breaks located on the plans indicate crisp transitions, not blended or rounded edges. These should be clean, sharp, and uniform in line and curve as indicated on the plans
 - 2. Lawn: Compaction of topsoil for finish grade shall be 85% to 88%.
- C. In the event of settlement, the Contractor shall readjust the work to required finished grade.

3.05 EDGING

- A. Steel edging shall be installed at locations indicated on the Drawings. Where required, edging shall be cut square and accurately to required length.
1. Steel edging shall be securely staked in required position. Stakes shall be driven every 30 in. o.c. along length of edging.
 2. Adjacent lengths of edging shall be spliced together with manufacturer's standard splicer unit.
 3. Edging shall be set plumb and vertical at required line and grade. Straight sections shall not be wavy; curved sections shall be smooth and shall have no kinks or sharp bends.

3.06 SEED APPLICATION

- A. Seed shall be broadcast by means of an approved mechanical spreader, to give a uniform application at the following rates:

<u>Seed</u>	<u>Application Rate</u> <u>lb./1,000 s.f.</u>
Penn Dot Formula B	4.0
Penn State Seed Mix	Confirm with PSU

- B. Seed shall be applied in two equal applications for uniform coverage; direction of travel of spreader for second pass shall be perpendicular to that of the first pass. Seeding shall not be done when it is raining or snowing, or when wind velocity exceeds 5 mph.
- C. At the Contractor's option, and with the permission of the Architect, seed may be spread by the hydroseeding method, utilizing power equipment commonly used for that purpose.
1. Seed shall be applied in two equal applications for uniform coverage; direction of second pass shall be perpendicular to that of the first pass. Seeding shall not be done when it is raining or snowing, or when wind velocity exceeds 5 mph.
 2. Seed, lime, fertilizer, and mulch shall be mixed and applied to achieve application quantities specified herein for the conventional seeding method, with mulch applied at the rate of 1,200 lb./acre. Other provisions specified above for conventional seeding shall apply also to hydroseeding.
 3. Mulch shall be applied in two stages with 5% to 10% of the quantity applied with seed and the balance applied separately.
 4. Seed shall not be placed in water until immediately before application.
 5. Centrifugal pumps shall not be used to apply seed mix without fiber mulch. Hand broadcast or use gear pump.
- D. Following seeding the area shall be lightly raked to mingle seed with top 1/8 to 1/4 in. of soil. Area shall then be fine graded. Stones and other debris greater than 1 in. in any dimension which are visible on surface shall be removed. Surface shall be rolled with a hand roller having a weight of 60 to 90 lb./ft. of width, and a minimum diameter of 2 ft.
- E. Following seeding and raking, entire area shall be watered by use of lawn sprinklers, or other approved means. Initial watering shall continue until the equivalent of a 2 in. depth of water has been applied to entire seeded surface, at a rate which will not dislodge the seed. Watering shall be repeated thereafter as frequently as required to prevent drying of the surface, until the grass attains an average height of 1/4 in. Watering methods and apparatus which may cause erosion of the surface shall not be permitted.

- F. Rope off entire seeded area to prevent vehicles and pedestrians from entering area.

3.07 LAWN RENOVATION

- A. Renovate existing lawn.
- B. Renovate existing lawn damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
 - 1. Reestablish lawn where settlement or washouts occur or where minor regrading is required.
- C. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.
- D. Where substantial lawn remains, mow, dethatch, core aerate, and rake. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
 - 1. Aeration shall be accomplished utilizing a roller, drum or piston-type aerator with coring or open-spoon tines of 1/2 in. to 3/4 in. diameter. Tines shall penetrate the soil to a minimum depth of 1-1/2 in. Final aeration pattern shall provide a minimum of 4 aeration holes per square foot of surface area.
 - a. Aeration cores shall not be collected.
 - b. Aeration shall be provided between March 1 and May 1.
 - 2. Dethatching shall be accomplished as needed to maintain thatch levels less than 1/2 in. thick.
 - a. Dethatching blades shall be adjusted so as to not cause damage to the turf which will detract from the quality of the turf 2 weeks after dethatching.
 - b. Debris brought to the surface in the dethatching process shall be removed from the site.
 - c. Dethatching shall be performed between April 1 and May 1 and between September 1 and October 15 only as needed as determined by the Contractor.
 - 3. Overseeding of designated cool-season turf areas shall be accomplished between September 1 to October 15 or March 1 to May 1 utilizing a device or system which places the seed in direct contact with the soil.
 - a. Overseeding of areas shall be preceded by dethatching as noted above when thatch buildup exceeds 1/2 in. thickness.
- E. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.
- G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches (150 mm).
- H. Apply soil amendments and initial fertilizers required for establishing new lawns and mix thoroughly into top 6 inches (100 mm) of existing soil. Provide new planting soil to fill low spots and meet finish grades.

- J. Apply seed and protect with straw mulch as required for new lawns.
- K. Water newly planted areas and keep moist until new lawn is established.

3.08 MAINTENANCE

- A. Except as otherwise specified below, maintenance shall include all operations required to produce an established lawn, including but not limited to:
 - Fertilizing
 - Mowing
 - Replanting
 - Watering
 - Weeding
- B. Maintenance of seeded areas shall begin upon completion of seeding and shall continue until acceptance of the building, or until mowing as specified below is completed, or until average height of grass is 1-1/2 in., whichever occurs later.
 - 1. Watering
 - a. Week No. 1: Provide all watering necessary to keep seed bed moist at all times. Perform watering daily or as necessary to maintain moist soil to a depth of 4 in.
 - b. Week No. 2 and Subsequent Weeks: Water as necessary to maintain adequate moisture in the upper 4 in. of soil to promote seed germination.
 - 2. Mowing
 - a. Mowing shall not be attempted until the sod is firmly rooted and securely in place. Not more than 40% of the grass leaf shall be removed during the first or subsequent mowings.
 - b. Bluegrass and other cool season grasses shall be maintained between 1-1/2 in. and 2-1/2 in.
 - c. All clippings shall be removed.
- C. Turf installations shall meet the following criteria as determined by Architect:
 - 1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding [90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm)]
- D. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.
- E. First mowing shall be done when average height of grass is 2-1/2 in., with mower set to cut at a height of 1-1/2 in. Subsequent mowings shall be made at not over two week intervals, with the height of cut set at 1-1/2 in. With prior permission of the Owner, mowings during periods of slow growth or dormancy may be spaced at greater intervals.
- F. Weeds and growth other than varieties of grass named in grass seed formula shall be removed. Removal may be accomplished by use of suitable herbicides or by physical removal, in which case top growth and roots shall both be removed, and bare spots exceeding specified limits shall be reseeded.

- G. If lawn or grass is established in the fall and maintenance is required to continue into spring months, lawn and grass shall receive an application of lime and fertilizer in the spring. Lime and fertilizer shall be spread in a uniform layer over the entire lawn surface, at the following rates.

<u>Material</u>	<u>Application Rate</u>
Lime	100 lb./1000 sq. ft. [as determined by soil test results]
Fertilizer	20 lb./1000 sq. ft. [as determined by soil test results]

3.09 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

1I. Remove rope barricades only after second cutting of lawns.

- C. Remove nondegradable erosion-control measures after grass establishment period.

3.10 WASTE MANAGEMENT

- A. Separate and dispose of waste in accordance with the Project's Waste Management Plan

END OF SECTION