SECTION 32 92 00

TURF AND GRASSES

PART 1 - DESIGN DIRECTIVES

1.1 SUMMARY

A. The information contained in this section is based on industry standards but more importantly, reflects techniques that have proven effective on the Dartmouth Campus. It is the intent of Dartmouth College that the consultants incorporate the requirements contained herein with the consultant's specifications to produce a document that is a cohesive, coordinated, non-conflicting project specific specification. Deviations from these standards shall be discussed with the appropriate FO&M representative.

1.2 DESIGN CRITERIA

A. Lawns should be carefully configured in landscape designs. Where feasible, lawns should be designed to reinforce connections between campus open spaces and reinforce a perception of campus unity.

B. Careful consideration shall be given to lawn maintenance concerns during the design process. Proposed lawns shall be designed in a manner that allows for efficient and economical maintenance.

C. Proposed lawns shall have positive drainage. Avoid the indiscriminate use of yard drains.

D. Lawn areas with slopes greater than 4:1 (25%) should be avoided. The maximum desirable slope for mowed lawns is 3:1 (33%), and flatter slopes are preferred where possible.

E. Groundcover should be considered in areas that are steeper than 3:1 or where the growth and maintenance of lawns is impractical.

1.3 QUALITY ASSURANCE

A. Engage an experienced Landscape Contractor. Landscape Contractor shall maintain an experienced full-time supervisor on the project site during times that grass planting or sodding is in progress.

B. Pesticide/herbicide application shall be made by experienced workmen under supervision of a licensed applicator approved by the Dartmouth Grounds Supervisor and/or Turf Manager. Coordinate all pesticide/herbicide application activities with the Dartmouth Grounds Supervisor.

C. Furnish a soil analysis made by a qualified independent soil-testing agency. Soil analysis must state.

1. Percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, and pH levels.
2. Sieve analysis and mineral and plant nutrient content of topsoil.
3. Test for pesticide/herbicide contamination and provide report certifying that no pesticides/herbicides are present.

4. Report suitability of topsoil for lawn growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce satisfactory topsoil.

1.4 DELIVERY, STORAGE AND HANDLING

A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.5 COORDINATION AND SCHEDULING

A. Coordinate a preconstruction conference at the project site. The Landscape Contractor, his/her project supervisor, and the Dartmouth Grounds Supervisor and/or Turf Manager shall attend this meeting. Review all drawings and project specifications.

B. Planting Season: Sow/sod lawn during normal planting seasons for type of lawn work required. Correlate planting with specified maintenance periods to provide required maintenance from date of acceptance.

1. Spring Planting Schedule
    a. Turf (seeded/sodded)

        1) April 15th – June 1st
2. Fall Planting Schedule
    a. Turf (seeded) – Aug. 25 – Nov. 1
    b. Turf (sodded) – Sept. 1 – Nov. 1

C. Weather Limitations: Proceed with seeded or sodding only when existing weather and forecasted conditions are suitable for work.

1.6 MAINTENANCE

A. Landscape contractor shall contact the Dartmouth Grounds Supervisor to review all necessary maintenance operations before maintenance period begins.

B. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established. Until the entire project is deemed acceptable the Owner will not assume a maintenance responsibility for any portion of a project site.

C. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, and replanting.

D. Roll, regrade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth lawn.

1. Replant bare areas with same materials specified for lawns.
2. Add new mulch in areas where mulch has been disturbed by wind or maintenance operations. Anchor as required.

E. Maintain temporary protection fences as necessary.

F. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment.

1. Landscape Contractor shall contact the Dartmouth Grounds Supervisor to review water source(s) availability and coordinate access to those source(s). If Dartmouth College water source(s) not available, Landscape Contractor shall provide water as required.
2. Keep lawns uniformly moist to a depth of 4 inches (100 mm). Water lawn at the minimum rate of 1 inch (25 mm) per week.
3. Establish a watering schedule that prevents wilting, puddling, erosion, and displacement of seed or mulch.

G. Begin mowing operations when grass reaches the specified height for principal species planted. Repeat mowing as required to maintain specified height without cutting more than 30 percent of the grass height.

H. Do not mow when the grass is wet.

I. Fertilization: Apply fertilizer to lawn after first mowing and when grass is dry.

1. Prior to application of fertilizers, submit manufacturers' product certification to the Dartmouth Grounds Supervisor and/or Turf Manager for approval.
2. Use fertilizer that will provide actual nitrogen of at least 1 lb per 1000 sq. ft. (0.5 kg per 100 sq. m) of lawn area.

1.7 ACCEPTANCE

A. The Dartmouth Grounds Supervisor and/or Turf Manager will inspect to consider acceptance of seeded areas upon Contractor's request.

B. Areas will be deemed acceptable when lawns meet establishment requirements and have received all required maintenance.

C. Lawns will not be deemed acceptable if any portion of the lawn, no matter how small an area, is bare or does not meet basic requirements for acceptance.

1.8 WARRANTY

A. All work shall be warranted for a minimum of one year from the Date of Acceptance.

PART 2 - **PRODUCTS**

2.1 SEED

A. Use only Dartmouth approved general-purpose lawn mixes. (See recommended seed mixtures under Seed Mixing Schedules later in this document.)

B. Grass seed shall be fresh, clean, and dry.

2.2 EROSION-CONTROL MATERIALS

A. Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.

B. Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, 0.92 lb per sq. yd. (0.5 kg per sq. m) minimum, with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.

PART 3 - **EXECUTION**

3.1 **EXAMINATION**

A. Examine areas to receive lawns and grass. Ensure that area complies favorably with conditions that might affect the performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydro-seed over-spraying.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 PLANTING SOIL PREPARATION

A. Limit subgrade preparation to areas that will be planted within 24 - 48 hours.

B. Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1/2 inch in any dimension and sticks, roots, rubbish, and other extraneous matter.

C. Spread 10 pounds of gypsum per 100 square feet of surface area on top of the subgrade material prior to spreading topsoil.

D. Topsoil must contain no gravel or particles with diameter greater than 2 millimeters (mm). Topsoil should have an infiltration rate of 4 to 8 inches per hour, and a bulk density of between 1.25 and 1.45 grams per cubic centimeter. Topsoil must have a pH of between 6 and 8 and must contain the following components.

1. 45% - 75% sand with 50% or more of this having particle size of 0.25 – 0.50 mm
2. 15% - 35% silt with particle size ranging from 0.002 – 0.05 mm
3. 5% - 20% clay with particle size of less than 0.002 mm
4. 5% - 20-% organic matter

E. Mix soil amendments and fertilizers with topsoil at rates recommended in soil reports from a qualified soil-testing agency indicated.

1. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days.
2. Mix soil before spreading or apply soil amendments on surface of spread topsoil and mix thoroughly into top 4 inches (100 mm) of topsoil before planting.
3. Mix lime with dry soil prior to mixing fertilizer.
4. Apply superphosphate fertilizer directly to subgrade before tilling, at the rate indicated.

F. Spread topsoil soil mixture to a depth of 9" thick. Ensure that all grades and elevations shown on appropriate construction drawings will be met after light rolling and natural settlement. Any areas where ponding is present after topsoil installation will need to be remediated through aeration or tilling to restore proper drainage.

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. Do not spread if planting soil or subgrade is frozen or if significant precipitation is anticipated while operations are ongoing

G. Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:

1. Remove and dispose of existing grass, vegetation, and turf. Do not turn over into soil being prepared for lawns.
2. Till surface soil to a depth of at least 6 inches (150 mm)
3. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches (100 mm) of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
4. In areas where tilling may injure tree or plant roots of existing trees to remain comply plant protection measures stated in Section 02120.
5. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
6. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property.

H. Grade lawn areas to a smooth, even surface with a 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.

I. Remove trash, debris, and stones larger than 1/2 inch in any dimension, as well as other objects that may interfere with planting or maintenance operations.

J. When soil is dry, moisten prepared lawn areas before planting. Water thoroughly and allow surface layer to dry before planting. Do not create muddy soil.

K. Restore prepared areas if eroded or otherwise disturbed after fine grading (due to bulb planting activities, etc.) and before planting.

3.4 SEEDING NEW LAWNS

A. Sow seed with a spreader or a seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other.

1. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.

B. Sow seed at the following rates:

1. 150 lbs./acre of approved mix or at rates specified by the Dartmouth Grounds Supervisor or Turf Manager.

C. Rake seed lightly into top 1/8 inch (3 mm) of topsoil, roll lightly and water with fine spray.

D. Protect seeded slopes exceeding 1:4 against erosion with erosion-control blankets installed and stapled according to manufacturer's recommendations.

E. Protect seeded slopes exceeding 1:6 against erosion with jute or coir-fiber erosion-control mesh installed and stapled according to manufacturer's recommendations.

F. Protect seeded areas with slopes less than 1:6 against erosion by spreading straw mulch after completion of seeding operations.

1. Spread straw mulch uniformly at a minimum rate of 2 tons per acre (45 kg per 100 sq. m) to form a loose, continuous blanket 1-1/2 inches (38 mm) deep over seeded areas. Spread by hand, blower, or other suitable equipment.
2. Anchor straw mulch by spraying with non-asphalt emulsion tackifier at the rate of 10 to 13 gal. per 1000 sq. ft. (41 to 53 L per 100 sq. m).
3. Take precautions to prevent damage or staining of structures or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.

G. Protect seeded areas against hot, dry weather or drying winds by applying peat mulch within 24 hours after completion of seeding operations. Soak and scatter uniformly to a depth of 3/16 inch (4.8 mm) thick and roll to a smooth surface.

3.5 HYDROSEEDING NEW LAWNS

A. Hydro seeding: Use equipment specifically designed for hydro seed application.

1. Mix slurry with non-asphalt tackifier.
2. Apply mulch at the minimum rate of 1500 lb per acre dry weight.

3.6 RECONDITIONING LAWNS

A. Recondition existing lawn areas damaged by Contractor's operations or areas where settlement or washouts occur or where minor regrading is required.

B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury into soil.

C. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spill, stone, gravel, and other construction materials, and replace with new topsoil.

D. Mow, dethatch, core aerate, and rake lawn areas. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergent herbicides.

E. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of it off the Owner's property.

F. Till strip, bare, and compact areas thoroughly to a depth of 6 inches.

G. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches (100 mm) of soil. Provide new planting soil as required to fill low spots and meet new finish grades.

H. Apply seed and protect with erosion controls blankets, mesh or straw mulch, or hydro seed as required for new lawns.

I. Water newly planted areas and keep moist until new grass is established.

3.7 SATISFACTORY LAWN

A. Seeded lawns will be satisfactory provided requirements, including maintenance, have been met and a healthy, uniform, close stand of grass is established, free of weeds, bare spots exceeding 5 by 5 inches (125 by 125 mm), and surface irregularities.

B. Replant lawns that do not meet requirements and continue maintenance until lawns are deemed satisfactory.

C. The Contractor shall guarantee to establish lawns in accordance with these Satisfactory Lawn Specifications within 18 months from the time of initial planting.

3.8 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto surface of roads, walks, or other paved areas.

B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades until lawn is established.

3.9 PLANTING SOIL AMENDMENTS SCHEDULE

A. Provide soil amendments as recommended in soil reports from a qualified soil-testing agency.

3.10 SEED MIXTURES SCHEDULE

A. Provide certified grass-seed blends or mixes, proportioned by weight, as follows:

1. Sun: Use mix approved by the Dartmouth College Grounds Supervisor or Turf Manager. Standard is Dartmouth Campus Mix as produced by Northeast Nursery, Inc. of Peabody, MA with the following general characteristics.

Proportion	Name
35%	Orbit Creeping Red Fescue
30%	Jumpstart Kentucky Bluegrass
13%	Gallup Perennial Ryegrass
12%	Benchmark Perennial Ryegrass
10%	Sox Fan Perennial Ryegrass

2. Shade: Use the following general-purpose Kentucky Bluegrass blend of shade mix or mix approved by the Dartmouth Grounds Supervisor or Turf Manager.

Proportion	Name
10 %	Eclipse
10 %	Bensun (A34)
10 %	Glade
60 %	Fine fescue var. Jamestown or Banner
10 %	Perennial rye var. Palmer or Prelude

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