

PART 1 GENERAL

1.1 SUMMARY

- A. Seeding.
- B. Hydroseeding.
- C. Erosion-control material(s).

1.2 RELATED REQUIREMENTS

- A. Section 31 1005 - Athletic Field Site Preparation: Turf removal and disposal.
- B. Section 31 2323 - Fill: Excavation, filling and backfilling, and rough grading.
- C. Section 32 9113.29 - Athletic Field Root Zone Mixing: Root zone mix.

1.3 DEFINITIONS

- A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Engineered Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.
- H. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.
- I. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 SUBMITTALS

- A. Qualification Data: For Athletic Field Contractor.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
- C. Certification of the Sod: From sod vendor/farm/supplier for each grass seed mixture used in the production of the sod it should state the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include year and month of sowing and date of harvesting.
- D. Product Certificates: For soil fertilizers, from manufacturer.
- E. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.
- F. Any changes to the means and methods of the athletic field construction, and/or materials, must be approved by the Landscape Architect.
- G. Completion of work is subject to adverse climatic conditions which could affect the date of substantial completion. Any/all delays must be communicated with the Construction Manager as soon as possible
- H. No work can progress unless testing results are approved by the Landscape Architect.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of athletic field turf during a calendar year. Submit before expiration of required maintenance periods.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified Athletic Field Contractor whose work has resulted in successful turf establishment as follows:
 - 1. General Experience:
 - a) Five (5) years' experience of athletic fields construction, resurfacing and/or renovations similar to scope of project over the last 3 consecutive years
 - b) Provide reports of above said athletic fields projects as to the type of projects involved in, including but not limited to; start and end dates, adherence to target/ key performance indicators, scope of works completed along with contact persons and contact details for said clients.
 - c) Provide testimonies from previous clients, including but not limited to; quality of work, staff/employee interactions, tidiness of site, timekeeping and punctuality and overall client satisfaction levels.
 - 2. Staff/Employees:

- a) Provide resumes for all staff/employees who will be responsible for carrying out scope of works, including but not limited to, full time and seasonal/short term employees.
 - b) Resumes will be required for all employees/staff involved in the project.
 - c) Resumes to include:
 - 1) Experience level relevant to the project needs/scope of work.
 - 2) Qualifications level relevant to the project needs/scope of work.
 - d) Must provide evidence that all staff/employees have at least 3 years' experience of similar scope of work for project over the last 3 consecutive years
 - e) Provide evidence of continued professional development of all/any employees involved in project for last 3 consecutive years.
 - f) Shall have a supervisor on the site who is experienced in the construction of sports fields. Supervisor's name and experience shall be submitted to the Landscape Architect for approval.
 - g) Shall have membership of one or more of the following Professional associations for a minimum of the last 3 consecutive years:
 - 1) New England Sports Turf Managers Association (NESTMA).
 - 2) Sports Turf Managers Association (STMA).
3. Insurances / Certifications:
- a) Must be in possession of a suitable level of public liability insurance and any other relevant insurances required by the state and/or client.
4. Equipment:
- a) Must be in possession and provide a detailed list of a suitable level of tools/equipment/machinery and or equivalent required to carry out the scope of work for said project.
 - b) All equipment and or equivalent should be in a condition able to carry out scope of work. Any certificates proving this will be required as part of the submission.
 - c) All proposed equipment to be used for seeding shall be approved by the Landscape Architect prior to commencing work.
5. Additional:
- a) Provide a project plan identifying all key indicator/target points, which clearly shows an integrated approach to quality control and quality assurance.
 - b) Provide a detailed methodology of how the required works will be carried out., this should be inclusive and synced to the project plan.
 - c) Contractor is required to submit samples, test results and/or certification of all material prior to delivery to the site. All materials are to be approved by the Landscape Architect prior to their use. These certifications shall comply with specifications and scope of project and where applicable, with any standards that may be implied.
6. Pesticide Applicator: State licensed, commercial.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.
- B. Sod should not be delivered to site until required for installation/laying
- C. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways, and pavements, or on existing turf areas or plants.

2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.
4. Fertilizers, lime, and soil amendments must be stored in a secure, locked area, and must be protected from the elements.

1.9 FIELD CONDITIONS

- A. Seeding Restrictions: Seed during one of the following periods, if climatic and ground conditions are favorable. Coordinate seeding periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.
 1. Spring Seeding: April 15th to June 15th.
 2. Fall Seeding: August 15th to October 15th.
- B. Sodding Restrictions: Sod during one of the following periods, if climatic and ground conditions are favorable. Coordinate sodding periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.
 1. Spring Sodding: April 1st to May 15th
 2. Fall Sodding: October 1st to December 1st.
- C. Weather Limitations: Proceed with seeding and sodding only when existing and forecasted weather conditions permit seeding and sodding to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 PRODUCTS

2.1 SEED

- A. Grass Seed: Must be certified through National Turf Grass Evaluation Program.
- B. Seed Mixtures: Seed of grass species as follows, with not less than 98 percent germination, not less than 98 percent pure seed, and not more than 0.2 percent weed seed:
 1. Seed Mix #1: Tall Fescue, Kentucky Blue and Ryegrass mix comprised of the following cultivars or equivalents:
 - a) 25% Amity Tall Fescue.
 - b) 25% ZigZag Tall Fescue.
 - c) 20% Mazama Kentucky Bluegrass.
 - d) 20% Metolius Perennial Ryegrass.
 - e) 10% Double Time Tetraploid Perennial Ryegrass.
 2. See Mix #2: Perennial Ryegrass mix comprising of the following cultivars or equivalents:
 - a) 40% Metolius Perennial Ryegrass
 - b) 40% Palmer 3 Perennial Ryegrass
 - c) 20% Double time Tetraploid Ryegrass

- C. Evenly apply 250 lbs. of Seed Mix #1 at the rate of 4 lbs./1,000 Sq. Ft. in two directions utilizing an unequal twin disc slitting system with a maximum 3" spacing between discs towed behind a LGP turf tractor or equal.
- D. Evenly apply 250 lbs. of Seed Mix #2 at the rate of 4 lbs./1,000 Sq. Ft. in one direction utilizing an unequal twin disc slitting system with a maximum 3" spacing between discs towed behind a LGP turf tractor or equal.
- E. ~~Seed of grass species as follows, with not less than 98 percent germination, not less than 98 percent pure seed, and not more than 0.2 percent weed seed:~~

2.2 PLANTING SOILS

- A. Topsoil: Amend topsoil for athletic field seed and sod areas as indicated in Section 32 9113.29 - Athletic Field Root Zone Mixing.

2.3 FERTILIZERS

- A. Nutrient application – Evenly spread soil amendment “Renovate Plus” or equal at the rate of 25 lbs./1,000 Sq. Ft. Lightly scarify and incorporate into the top 1 to 2 inches of new rootzone profile utilizing a super rake surface preparation machine or equal.
- B. Nutrient application – Evenly spread seedbed amendment “Myco-Replenish 3-3-3 SG or equal at the rate of 10 lbs./1,000 Sq. Ft.
- C. Evenly spread seedbed amendment and 4-way wetting agent “Vivax Plus Fertilizer 0-0-20 SG” or equal at the rate of 5 lbs./1,000 Sq. Ft.
- D. Nutrient application for SOD areas only – Evenly spread fertilizer and hydration molecules “0-0-20 with Cascade” or equal at the rate of 8lbs./1000 Sq. Ft. on top of the installed sod. Product shall be watered in to enable absorption and activation. The use of this product is intended to promote water movement through the existing sod thatch layer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to be seeded or sodding for compliance with requirements and other conditions affecting performance.
 - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 4. Uniformly moisten excessively dry soil that is not workable, and which is too dusty.
 - 5. Proceed with installation only after unsatisfactory conditions have been corrected.

- B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
- B. Install 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 TURF AREA PREPARATION

- A. General: Prepare planting area for soil placement and mix root zone mix according to Section 32 9113.29 - Athletic Field Root Zone Mixing.
- B. Placing Root Zone Mix: Place and mix root zone mix in place over exposed subgrade according to Section 32 9113.29 - Athletic Field Root Zone Mixing.
- C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create waterlogged soil.
- D. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 SEEDING

- A. Evenly apply seed as specified in two (2) to three (3) directions, utilizing LGP turf tractor mounted unequal twin disc slitting system with a maximum 3-inch spacing between discs or equivalent as specified in Section 32 9115 "Root Zone Mix Preparation and Blending".
 - 1. Do not use wet seed or seed that is moldy or otherwise damaged.
 - 2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of 3 to 4 lb./1000 sq. ft. (1.4 to 1.8 kg/92.9 sq. m).
- C. After seeding is completed and if ground conditions allow roll lightly (this is to create subtle consolidation or firming; over rolling will create a compacted rootzone which is detrimental to the overall process), and water with fine spray.
- D. The Contractor must utilize LGP turf tractor mounted with an oscillating arm broadcast applicator or equivalent to broadcast spread the following:
 - 1. Nutrient amendments – "Earthworks Micro Replenish 3-3-3 SG" or equivalent at specified rates.
 - 2. Nutrient and hydration amendment – "Precision Labs Vivax 0-0-20" or equivalent at specified rates.

3.5 TURF MAINTENANCE (INCLUSIVE OF GROW-IN AND ESTABLISHMENT)

- A. Maintain and establish turf (seeded and sodded areas) by utilizing proper irrigation, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. For seeded areas only, regrade, and replant bare or eroded areas

to produce a uniformly smooth turf. The Contractor must provide materials and installation the same as those used in the original seeded and sodded areas.

1. Fill in as necessary soil subsidence with a rootzone mix that is consistent with the existing materials, which may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering:

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed.
2. The Contractor is required to furnish, install, and maintain a system of temporary pipe, sprinklers and service connections which are adequate to water the turf areas daily to maintain appropriate moisture levels which will sustain turf health and vigor, and to promote root development.
3. Two times a week, the Contractor must monitor Volumetric Moisture Content (VMC) with a moisture probe such as a PogoPro Plus or equivalent to assure that the rootzone has sufficient moisture content. As guidance the VMC should be no less than 20% to 30% areas tested. Twenty (20) designated points on the field as per the attached drawing/diagram.

C. Grow-In Agronomic Requirements

(actual seeding time may accentuate a change to the following approach):

1. Apply fertilizer to dry turf and water in post application.
2. Ten (10) days after seeding the Contractor must utilize LGP turf tractor mounted with an oscillating arm broadcast applicator or equivalent, to broadcast spread Lebanon Country Club 13-25-12 or equivalent at 1lb./1000 P.
3. Twenty-one (21) days after seed germination the Contractor must utilize LGP turf tractor mounted with an oscillating arm broadcast applicator or equivalent, to broadcast spread Lebanon Country Club 24-0-18 or equivalent at 1.25lb/1000 of N.
4. Forty-two (42) days after germination the Contractor must evenly apply seed as specified in one (1) direction the specific 80/20 seed blend or equivalent at 4lbs./1000, utilizing LGP turf tractor mounted seed injection implement or equivalent as specified in the site work construction equipment specifications.
5. Forty-nine (49) days after germination the Contractor must utilize LGP turf tractor mounted with an oscillating arm broadcast applicator or equivalent, to broadcast spread Earthworks Replenish 5-4-5 or equivalent at 1lb./1000 of N.
6. Product solutions supplier requirements – Must make weekly visits to assist contractor on fertility, performance turf establishment and product effectiveness.

D. Mowing:

1. Mow seeded areas once top growth reaches an average height of one and a half (1.5) inches. Mow to the height of one and a half (1.5) inches.
2. Mow sodded areas to maintain a height of one and a half (1.5) inches.
3. All clippings **MUST** be removed off site or to a designated area.
4. It is preferable that the clippings be disposed of by composting.
5. It is advisable that the initial mowing should be carried out utilizing a walk behind or pedestrian type mower.
6. Mow turf utilizing a rotary cutting action mower with new or properly sharpened blades, and a collection system.

7. Repeat mowing as growth permits but not more than three (3) times per week to maintain specified height of cut.
8. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings.
9. Do not mow when grass is wet or during adverse ground or climatic conditions.
10. Schedule initial and subsequent mowings to maintain the following grass height:
 - a) Mow to a height of one and a half (1.5) inches until bluegrass has reached the average height of one and a half (1.5) inches.
 - b) Once bluegrass has reached specified height, raise mowing height to two (2) inches.

3.6 SATISFACTORY TURF

- A. Seed and sod installations shall meet the following criteria as determined by Architect:
 1. Satisfactory Seeded Turf Areas: 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. and bare spots not exceeding 3 by 3 inches.
 2. Satisfactory Sodded Turf Areas: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage of 100 percent over any 10 sq. ft. and no bare spots should be visible. Healthy root development (an average of 2.5") should be achieved. Thatch levels of no more than three quarters (3/4") of an inch shall be present.
- B. Use previously specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf complies with requirements.
- C. Substantial Completion Field Testing:
 1. Soil structural consolidation readings at the six (6) inch depth must be a minimum of one-hundred and twenty (120) psi and a maximum of One hundred and Seventy-Five (175) psi using a digital penetrometer or equivalent. The readings will be taken at THIRTY (30) designated points on the field as per the attached drawing/diagram
 2. Surface Impact Levels must be a minimum of fifty (60) Gravities to a maximum of seventy (70) Gravities using a Clegg Surface Impact Tester or equivalent. The readings will be taken at twenty (20) designated points on the field as per the attached drawing/diagram
 3. Infiltration rate of water into the rootzone must achieve a minimum of two (2) inches per hour. The reading will be taken at five (5) designated points on the field as per the attached drawing/diagram
 4. If any of the above readings are outside of the agreed tolerances, then corrective action will need to be carried out. This would be following consultation between the Landscape Architect, Landscape Architect's Representative, and Contractor.

3.7 RESTORATION OF SETTLED GRADES

- A. At the end, twelve months after the date of substantial completion of the soil installation work, inspect the site and restore any areas where the grades have settled beyond the elevations shown on the Drawings.

3.8 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, walkways, 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 maintenance period and remove after plantings are established.

3.9 MAINTENANCE SERVICE

- A. Turf Maintenance Service: Provide full maintenance by skilled employees of Athletic Field Contractor. Maintain as required in "Turf Maintenance" Article. 3.7 (above) Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:
 - 1. Seeded Turf: 120 days from date of Substantial Completion.
 - 2. Sodded Turf: 120 days from date of Substantial Completion.
 - 3. When maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

END OF SECTION