

SECTION 32 92 00 _ Turf and Grasses

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PART 1 – GENERAL

Information in this Section is to be followed unless otherwise directed by University of Delaware (UD) Owner Representative **and** UD Grounds Representative.

Definition of UD Grounds Representative = UD Assistant Director of Grounds and UD Landscape Planner or their designated Grounds Representative.

1.1 SUMMARY

This section defines standards for turf installation or restoration from start of project through final acceptance. Included are standards for soils and turf bed prep, seed/sod specifications, handling, installation and maintenance until project completion.

1.3 QUALITY ASSURANCE

- A. Codes and Standards: Perform all work in compliance with applicable requirements of governing authorities having jurisdiction.
- B. Installer Qualifications: Engage an experienced Installer who has completed landscape work similar in material, design, and extent to that indicated for turf work and with a record of successful turf establishment
- C. Installer’s Field Supervisor: Installer is to maintain an experienced full-time supervisor on the Project site during all times throughout execution of this portion of the Work, who is thoroughly familiar with proper materials and methods for successful soil and turf installation, to direct all work performed under this Section. This person shall have a minimum of 5-years’ experience in successful turf establishment.
- D. Seeding and Sodding:
 - 1. All materials are subject to approval by UD Grounds Representative., who may inspect materials either at place of growth or at site before installation, for compliance with specified species and materials.
 - 2. All seed and sod are to be provided as specified. Requests to use substitutions shall be made prior to delivery of materials to site and only with written permission by UD Grounds Representative
 - 3. In the event that quantity discrepancies or material omissions occur between the Plant List and Planting Plan, Contractor is to immediately UD Grounds Representative. for clarification about how to proceed.

4. Seed and Sod handling shall comply with State and Federal laws, including quarantines with respect to inspection, plant diseases and insect infestation.
 - Sod shall be relatively free of thatch and subject to approval by UD Grounds' Representative.
 - Sod shall be free of diseases, nematodes and soil-borne insects.
5. Permanent lawn plantings are ideally installed during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Final Acceptance of lawn areas:
 - Seeding: April 1- May 31, August 15 – October 15
 - Spring Planting: April 1- May 31 – or once soil temperatures reach a minimum of 50 degrees Fahrenheit.
 - Fall Planting: August 15 – October 15
6. Proceed with installation only when existing and forecasted weather conditions permit. If projected or current weather will undermine turf installation, reschedule installation times and dates.
 - In the event that a project needs to stabilize a site during winter months or times when sod/ seed needs to be installed outside of optimum planting times, site should be stabilized according to DNREC regulations, with the contractor returning at the next optimal planting time to properly install and establish the lawn area as per requirements for Final Acceptance.

E. Equipment:

1. Provide machinery and equipment necessary for the prompt, professional completion of the work. Such machinery shall be adequate to the task required and shall be operated by a person skilled and experienced in both operation of the equipment and the implementation of the task.
2. Upon request, promptly furnish satisfactory evidence of the organization, operator and equipment to be made available for the performance of the work.

F. Submittals, Documentation and Coordination:

1. *Submit documentation prior to the start of work* under this Section that all related materials have been ordered.

2. *Seed*: Submit certification of grass seed from seed vendor for each grass-seed monostand or mixture stating the botanical and common name and 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 - certification should be current.
3. *Sod*: Submit an invoice or sales slip identifying quality and species present in sod.
4. *Coordination with soil installation*: Install sod / seed only after finish grades are established **and approved by** UD Grounds Representative
5. *Amendments, Soil Analysis and Soil Samples*: Obtain analysis of soil, as per below, from an accredited soil laboratory, to determine suitability of topsoil and subsoils for lawn growth.
 - i. Excavated topsoil (if proposed for reuse):
 1. Lab Analysis for physical, organic and chemical composition;
 - ii. Excavated subsoil (if proposed for reuse);
 1. Lab Analysis for physical, organic and chemical composition;
 - iii. Imported Topsoil:
 1. Current Lab Analysis for each batch of topsoil brought onsite;
 2. #1 sample, clearly labelled with soil type and date, from same batch as used for soil analysis;
 3. Name and location of vendor / source;
 - iv. Imported Subsoil:
 1. Current Lab Analysis for each batch of subsoil brought onsite;
 2. #1 sample, clearly labelled with soil type and date; from same batch as used for soil analysis;
 3. Name and location of vendor / source;
 - v. Fertilizer / Amendment – determined by soil analysis:
 1. Lab analysis of soils for nutrient deficiencies & Recommendations
6. *Notification of intent to install soil, seed and sod* is to be provided 10 calendar days to UD Grounds Representative prior to delivery to site, and prior to installation, to ensure sufficient time to coordinate site reviews / observation of work.

PART 2 – PRODUCTS

2.1 SEED

- A. Seed Species:
Seed of grass species as defined by project, with not less than 95% germination, not less than 95% pure seed.

For restoration or establishment of lawn areas:

- Turf Type Tall Fescue blend - blend should include 2 or more varieties (do NOT use standard 'Contractor's Mix');
- *Apply at rate of 8lb. per 1000sf;*

For restoration or establishment of 'no-mow' naturalized areas or shady lawn areas include some or all of the following – seed mix to be approved by UD Grounds Representative prior to purchase);

- Ecostar Hard Fescue;
 - J-5 Chewing Fescue;
 - Audubon Red Fescue;
 - Rescue 911 Hard
- Apply at rate of: 5lb. per 1000sf.*

- B. Seed should be fresh, clean and dry.

2.2 SOD

- A. Sod Variety: ***Turf Type Tall Fescue blend (three-way blend);***

Sod that contains 90% or more of one species shall be sold as that species. Blends of species accounting for less than 90% of the mix shall be labeled as such, with the variety of species identified.

- B. Premium Grade Sod shall contain only the species and variety of turf grass specified, and no weeds or foreign species present.
- C. Pad Size: Individual pieces of sod shall be cut to the supplier's standard width and length, at a uniform soil thickness. Measurement for thickness excludes top growth and thatch. Maximum allowable deviation from standard widths and lengths shall be plus or minus 0.5 inch (on width and plus or minus five percent on length). Broken pads and torn or uneven ends will not be acceptable.
- D. Standard size sections of sod shall be strong enough that it can be picked up and handled without damage. Small sod pieces or cuts shall be avoided.

- E. Sod shall not be harvested or transplanted when its moisture content (excessively dry or wet) may adversely affect its survival.
- F. Before harvesting, cool season turf should be mowed uniformly to a height of 2.5 - 3.5", and warm season turf should be mowed uniformly to a height of 0.5 – 1.0".

2.3 IMPORTED SOILS

To be used only after review and approval by UD Grounds Representative.

A. Imported Topsoil:

1. Satisfactory Imported Topsoil shall be a naturally produced USDA loam, and within 2% of optimum MC for soil type or as per field inspection by UD Grounds Representative at time of installation and during any time of soil manipulation / earthwork; soil to be suitable for the germination of seeds and the support of vegetation;
2. Shall be free from subsoil, sod, frozen material, weeds, plant or construction debris, large rocks or soil clods, woody material, refuse of any type or any item over .5" diameter;
3. Soils are not to be manipulated or installed when wet, muddy, frozen or overly dry;
4. Shall have the following physical and chemical composition, as verified by onsite evaluation and current soil test / analysis from reputable soil testing laboratory:
 - **Sand: 40 – 65%**
 - **Silt: 15 – 30%**
 - **Clay: 5 – 25%**
 - **Silt and Clay in combination: less than 65%**
 - **pH shall be based on the specific plant requirements but will be within the range of 5.5 - 7.0, inclusive;**
 - **minimum of 4% organic matter and no more than 8%;**

B. Imported Subsoil:

1. Satisfactory Imported subsoil shall be within recommended MC for soil type or as per field inspection by UD Grounds Representative at time of installation and during any time of soil manipulation / earthwork;
2. Satisfactory Imported Subsoil shall be a naturally produced USDA subsoil with low organic matter (no more than 2%);
3. Shall be free of large rocks (anything greater than 2"D), organic or woody material, clods, sod, frozen material, noxious weeds, vegetation, construction debris or refuse of any type;
4. Shall have the following physical and chemical composition, as verified by onsite evaluation and current soil test / analysis from reputable soil testing laboratory:
 - **Sand: 40 – 57%**
 - **Silt: 15 – 30%**
 - **Clay: 5 – 13%**

- **Gravel:**
 - **7.7% - 6.3mm (1/4")**
 - **0.3 % – 4mm (#5)**
 - **2.2% - 2mm (#10)**
- **Organic matter: .25 – no more than 2%**
- **pH shall be based on the specific plant requirements but will be within the range of 5.5 - 7.0, inclusive**

2.4 EXCAVATED SUBSOILS (TOPSOIL AND SUBSOIL)

- A. To be used only after field review and approval for re-use by UD Grounds Representative. *UD reserves the right to request soil analysis and testing for any in-situ material being proposed for re-use.*
- B. Soils are not to be manipulated when wet, muddy, frozen or when drought conditions exist;
- C. **Excavated Topsoil:**
 1. Remove grass and sod prior to stripping topsoil;
 2. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials;
 3. Remove subsoil and non-soil materials from topsoil including trash, debris, weeds, lumps, clods, gravel, roots and debris including objects greater than .5" D;
 4. Inspection of topsoil by Grounds Manager and Landscape Planner is required;
 5. In the event of unsuitable soils or inability to store and reuse existing, suitable topsoils are to be provided as per Imported Topsoil described in 2.3 of this specification;
 6. Soils are to be stored without intermingling of other materials, and shall be reinstalled only when within 2% of optimum moisture content for soil type at time of installation and compaction, or as is considered reasonably dry by field verification from UD Grounds Representative.
- D. **Excavated Subsoil:**
 1. Excavate subsoil in a manner to prevent intermingling with topsoil, organic material or other waste materials;
 2. Remove organic materials and non-soil materials from topsoil including trash, debris, weeds, lumps, clods, gravel, roots and any foreign item;
 3. Inspection of subsoil by UD Grounds Manager and Landscape Planner is required;
 4. In the event of unsuitable soils or inability to store and reuse, suitable backfill materials are to be provided as per Imported Subsoils as described in 2.3 of this specification;

5. Soils are to be stored without intermingling of other materials and shall be reinstalled only when within 2% of optimum MC for soil type or as per field inspection by UD Grounds Representative.

2.5. COMPOST

- A. Compost shall be well decomposed, stable, weed free organic plant matter source, brown in color (black indicates possible burning), parent material no longer visible, structure is a mixture of fine and medium size particle and humus; Moisture: 30-40%, no ammonia or anaerobic odor (smells like rich hums from forest floor); pH : 6.5 – 8.5
- B. Compost added to existing soil is to be added at a 2" depth per 6" soil and turned/mixed to a depth of 4 - 6" for turf areas. Final compost: soil ratio should not exceed 8% organic matter in final mixture of soil. Final mixture should meet the specifications set forth for Imported Topsoil.

2.6 FERTILIZER AND SOIL AMENDMENTS

- A. Soil amendments and fertilizers are to be purchased and installed as per soil analysis recommendations and rates.

2.7 MULCH

- A. Penn Mulch Seed Accelerator – to be applied as per manufacturer's recommended methods and rates.
- B. Do NOT use loose straw or hay mulch.

2.8 EROSION CONTROL BLANKETS / BIO-NET

- A. Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable mesh. Include manufacturer's recommended staples, 6 inches (150 mm) long – if non-biodegradable staples are used, contractor is to remove them after establishment phase is complete.
- B. Erosion-Control Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended staples, 6 inches (150 mm) long if non-biodegradable staples are used, contractor is to remove them after establishment phase is complete.
- C. DO NOT USE PLASTIC OR NON-BIODEGRADABLE NETTING

PART 3- EXECUTION**3.1 TURF BED PREPARATION**

- A. Limit disturbance in areas under tree canopies and on slopes; do not perform site/ soil work in wet, frozen or muddy conditions, or in times of extreme drought that will cause undue compaction of dry soils;
- B. Restore areas if eroded or otherwise disturbed after finish grading and before planting.
- C. **Bed prep for areas damaged or disturbed by activity – includes but not limited to haul road, lay-down, material storage, event activities, etc.:**
 - 1. Remove all debris until existing topsoil or sub soil layer is revealed, and is existing without any remaining contamination or intermingling of construction material, fill, foreign soils, etc.;
 - 2. Loosen existing grades or subgrades to a depth of 12” and to an extent that water infiltration and decompacted soil conditions will support plant or lawn health;
 - 3. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - 4. Verify that sub-grades and finish grades are accurately established;
 - 5. Spread approved topsoil or subsoil as needed to meet finish grades as per plans or to match existing adjacent grades after light rolling and natural settlement.
 - 6. Incorporate compost and fertilizer as directed by soil analysis / soil test;
 - 7. Perform finish grading;
 - i. Uniformly grade areas to a smooth surface, free from irregular surface changes;
 - ii. Comply with compaction requirements and grade to cross sections, spot elevations, benchmarks, lines, and contours indicated on plans, or as existing conditions warrant;
 - iii. Slope grades to direct water away from buildings and central lawn or bed areas, and to prevent ponding (ensuring appropriate crowing in central lawn areas as conditions require);
 - iv. Provide a smooth transition between adjacent existing grades and new grades, including and especially in areas of material change from turf to planting, turf to pavers, planting to pavers, etc.;
 - v. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances

- D. **Bed prep for areas needing turf replacement / rejuvenation NOT caused by damage to area:**
If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, or any other activity, prepare surface soil as follows:
1. All stumps, weeds, vegetation not being retained are to be grubbed out and/or removed. After grass or vegetation has been removed, dispose off site in a manner that does not contaminate existing surface soil.
 2. Loosen surface soil to a depth of at least of 6 inches. Apply soil amendments and fertilizers (as needed) as per soil test and mix thoroughly into top 6 inches of soil.
 3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
 4. Verify finish grades are accurately established.
 5. Perform finish grading;
 - i. Uniformly grade areas to a smooth surface, free from irregular surface changes;
 - ii. Comply with compaction requirements and grade to cross sections, spot elevations, benchmarks, lines, and contours indicated on plans, or as existing conditions warrant;
 - iii. Slope grades to direct water away from buildings and central lawn or bed areas, and to prevent ponding (ensuring appropriate crowing in central lawn areas as conditions require);
 - iv. Provide a smooth transition between adjacent existing grades and new grades, including and especially in areas of material change from turf to planting, turf to pavers, planting to pavers, etc.;
 - v. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances

3.2 DELIVERY, STORAGE AND HANDLING

- A. Seed:
1. Deliver seed in original sealed, labeled, and undamaged containers.
- B. Sod:
1. Sod shall be harvested, delivered and installed/transplanted within a period of 24 hours, unless a suitable preservation method is approved by UD Grounds Representative prior to delivery.

2. Sod shall be delivered to the site specified and unloaded using equipment furnished by the sod supply contactor. Palletized or large-roll turf grass sod shall be unloaded at the location(s) designated for this purpose at the installation site.
3. Sod should be without any signs of stress upon arrival to job-site; sod showing signs of decline or stress will be rejected.

3.3 LAYOUT

- A. As per accompanying plans or as directed in the field by Owner or Owner's representative;
- B. The location of new turf areas are to be reviewed and, if necessary, staked out with UD Grounds Representative prior to installation.

3.4 SEED / SOD INSTALLATION

- A. Broadcast Seeding:
 1. Ensure soil surface is scarified, and free of debris.
 2. Spread seed with a broadcast or drop spreader uniformly to all areas to be seeded as per project specifications and rates.
 3. Seed shall be raked, rolled or 'dimpled in', depending upon project size, to ensure full contact of seed to soil.
 4. Keep top layer of soil evenly moist until grass is established and mowed for the first time.
 5. Install approved mulch after seed installation is complete.
- B. Hydroseeding:
 1. Meets or exceeds DNREC requirements for hydro-seeding.
 2. Keep seeded areas evenly moist until grass is established, and area is mowed for the first time.
 3. Ensure no drift of hydroseeding operations is allowed into areas not proposed for new seed installation.

C. Sod:

1. Ensure surface is scarified, and free of debris.
2. Lay sod strips in a running bond pattern perpendicular with any slopes, staggering seams. All seams and edges shall be tight and free from gaps, with sod roots in thorough contact with soil.
3. Add topsoil to sod edges, if necessary, to ensure successful establishment and knitting of seams.
4. Lightly roll the sod after installation to remove uneven areas and to ensure good sod to soil contact.
5. As sod is installed, it should immediately be watered.
6. Edge sod as needed along paving, planting beds, etc.
7. Sod should not be installed on the day before a weekend or period when the University is closed unless under care of project or contractor.

3.5 MULCH INSTALLATION

1. For PennMulch or Bio-net; installation is to be as per manufacturer's recommendations.

3.6 WATERING

1. Water newly seeded or sodded areas immediately after installation, and thereafter to keep newly sodded or seeded areas moist until Final Acceptance.
2. Water sods as it is installed and ensure thorough saturation of root zone.
3. Over watering and pooling should be avoided for both seed and sod.

3.7 PROTECTION, CLEAN-UP AND MAINTENANCE

1. During turf installation or renovation, keep pavements clean and work area in an orderly condition. Place 3/4" plywood as needed to protect existing turf, paved areas, etc.
2. Install plastic safety fencing to provide barrier protection for newly planted areas or areas to be preserved.
3. Protect existing plantings and turf from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damage to new or existing plantings or turf at the expense of the Landscape Contractor.
4. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.
5. Maintain (include mowing) until condition is approved by UD Grounds Representative. All turf areas which fail to germinate or, for sod, fail to knit and actively produce vegetative root growth within 2 weeks of installation shall be replaced at Contractors expense.
6. Satisfactory Seeded Lawn: A healthy, uniform, close stand of grass shall have been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches by final acceptance.

3.8 REQUIREMENTS FOR FINAL ACCEPTANCE

Sod remains in the care of the contractor until written confirmation of acceptance is provided by UD Grounds Representative.

Satisfactory Seeded or Sodded Lawn:

1. A healthy, uniform, close stand of grass shall have been established, free of weeds and surface irregularities, well rooted, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

PART 4 – ATTACHMENTS (no content)

END OF SECTION