

SECTION 32 92 00 – TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Fine grading and preparing seeded areas.
 - 2. Applying topsoil.
 - 3. Furnishing and applying soil amendments.
 - 4. Furnishing and applying fertilizers.
 - 5. Seeding & sod installation
 - 6. Reseeding and sod installation at unsatisfactory or damaged areas.
 - 7. Mulch applications.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, and as described below.
 - 1. Label each submittal with the Specification number and line-item number(s).
 - 2. Do not combine submittals from different Sections.
- B. Turf and Grasses Submittals Tracking List: Spreadsheet indicating each submittal required by this Section, labeled by name and Specification and line-item number, with columns for each submittal indicating dates of submittals, reviews, and completion of reviews/revisions process.
 - 1. Submit to University Representative no later than three months after project start date, or two months prior to planting, whichever is earlier.
 - 2. Update and submit monthly during months of preparation, purchasing, planting, maintenance, and close-out.
 - 3. Provide copies of each correspondence to University Landscape Architect and Project Landscape Architect, ThinkGreen LLC.
- C. Samples of each of the following:
 - 1. Mulch.
- D. Certification of seed from seed vendor for each grass-seed 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.
 - 1. Seed must be Blue Tagged Certified Seed and must contain requirements indicated herein. Submit seed breakdown tags to the Owners Representative for approval. Tags must

show percentage of seed varieties, weed seed, inert matter, and date of "Germination Test" done within a nine-month period prior to sale of the seed.

- E. Certification by product manufacturer that the following products supplied comply with requirements:
 - 1. Soil amendments.
 - 2. Fertilizers.
- F. Identify nursery source and availability of seed mixes within 30 days of the award of contract. Submit to Owners Representative for approval before ordering materials.
- G. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of architects and owners, and other information specified.
- H. At least 30 days prior to intended use, provide the following samples and submittals for approval in conformance with the requirements of the Section. Do not order materials until the Owners Representative provides acceptance of samples, certifications or test results have been obtained.
- I. Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated.
 - 1. Analysis of existing topsoil (representative sample from stockpile).
 - 2. Analysis of imported topsoil.
- J. Seeding and sod installation schedule: Submit proposed seeding and sod installation schedule during normal seasons for such work in area of site. Perform seeding and mulching upon completion of planting. Coordinate seeding schedules with planting schedules. Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.
- K. Submit verification that hydro mulch applicators are certified to operate equipment.
- L. Submit letter notifying the Owners Representative of completion seeding and sod installation, including maintenance instructions for Owner's use, and requesting inspection to determine acceptability for Substantial Completion and beginning of warranty period.
- M. Submit letter to the Owners Representative requesting a final inspection of seeding and sod for Final Acceptance at end of warranty period.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful grass establishment.
- B. Qualification of Foreman or Crew Leader: Each item of Work of this section shall be supervised by a foreman or crew leader who is a certified landscape professional.
 - 1. Landscape professional shall be a Pennsylvania Certified Horticulturist or Landscape Technician certified by the Pennsylvania Landscape and Nursery Association.
 - 2. Certification shall be current.

- C. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Architect's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated and make recommendations without delaying the Work.
 - 1. Qualified independent soil-testing laboratories include, but are not limited to:
 - a. Earth Works, Martins Creek, Pennsylvania; phone: 800-732-TURF.
- D. Topsoil Analysis: Furnish an agronomic profile of the topsoil made by a qualified independent soil-testing laboratory stating percentages of organic matter and inorganic matter (silt, clay, and sand); pH, total exchange capacity, mineral and plant-nutrient content, base saturation percentages and deleterious material.
 - 1. Report suitability of topsoil for growth of proposed seed and plant material as specified in Section 32 9300-Planting. State deficits and recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil that complies with the following percentage of base saturation:

BASE SATURATION

<u>Element</u>	<u>% range desired</u>	<u>ideal %</u>
Ca	60-70%	68%
Mg	10-20%	12%
K	2-5%	5%
Na	0.5-3%	0.75%
Other Bases (variable)	2-4%	3.75%
Exchangeable Hydrogen	10-15%	10.50%
pH	6.2-6.7	6.5

- E. Provide the Owners Representative with copies of soil test results a minimum of 30 days prior to any grading, seeding or sodding.
- F. Submit a Percolation Rate Test prior to the commencing of any seeding or planting activity as outlined in Earth Moving, or if not specified therein, as required by Penn State University Standards. This test is intended to determine the rate of percolation of the existing subgrade.
- G. The seed producer shall specialize in grass seed production with a minimum of 5 years' experience and shall be certified by the Pennsylvania Department of Agriculture as outline in Title 3 (Agriculture) of the Pennsylvania Consolidated Statures.
- H. Seed must comply with all commonwealth of Pennsylvania seed certifications.
- I. Pre-installation Conference: Conduct conference at Project site to comply with Section General Requirements, "Project Meetings."

1.5 DELIVERY, STORAGE, AND HANDLING

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

1. Each seed container shall be in sealed 50# bags labeled by manufacturer and/or grower and indicating weight and analysis
 2. Seed shall be accompanied with delivery tickets specifying percentage of germination, purity, and noxious weed content.
- B. Deliver and store fertilizer, lime and seed in original unopened packages. Keep dry, and unopened until needed for use.
1. Keep away from contaminants, insects and rodents.
- C. Sod: Sod shall be reviewed by the Owners Representative at the job site prior to installation. The Owners Representative reserves the right to reject any sod they deem unacceptable.
1. All sod delivered from the supplier shall be installed on the same day as delivery.
 2. Each palette, flat, or specified group of sod shall be labeled by the grower or manufacturer as separate items.
 3. During delivery and storage, sod materials shall be protected from any drying or contamination by detrimental material.
 4. Sod shall not be dropped or dumped from vehicles

1.6 COORDINATION AND SCHEDULING

- A. Planting Season: Sow seed and place sod during following planting seasons for type of work required. Correlate seeding with specified maintenance periods to provide required maintenance from date of Substantial Completion.
1. Lawn Seeding: April 1 to May 15 or August 15 to September 30, further restricted as specified below.
- C. Weather Limitations: Proceed with seeding only when existing and forecast weather conditions are suitable for work.
- D. No seeding or sodding is to be done when the ground is frozen or during days of extreme heat (≥ 85 degrees).
- E. No seed or sod shall be installed before April 1st or a minimum of 3 consecutive days of 55 degree soil temperatures.
- F. If work must be performed outside of these parameters, the Owners Representative must be contacted.

1.7 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Warrant seed and sod areas as follows except for incidents that are beyond the Contractor's control:
1. Seeding & Sodding: Warrant areas for a period of 90 days after date of Substantial Completion. Grass areas shall be vigorous and thriving, free of objectionable quantities of weeds and other undesirable growth. Seeded lawn coverage shall exceed 90% over

- any ten-foot square area, and each bare spot shall not be larger than 2" x 2". Sod shall be vigorous, well-rooted, and with no more than 5% dead or browning, with no gaps.
2. When full warranty period has not elapsed before end of normal growing season, or if vegetation is not fully established at that time, continue warranty during next normal growing season.
- C. In seeded areas, reseed bare spots larger than those allowed with seed and mulch with same materials specified for respective areas.
 - D. At end of warranty period and after final inspection, remove site protections, and seed, mulch and sod with same materials specified for respective areas.
 - E. Exclusions from the Warranty: Where evidence exists of damage that is beyond the Contractor's control, advise the Owners Representative in writing, stating location and nature of damage. The Owners Representative, upon receipt of such notice, may order the Contractor to correct the damage at the Owner's expense, or exclude the damaged areas from the warranty provisions and correct the damage by any arrangement deemed appropriate by the Owners Representative.

1.8 SEED AND SOD AREA MAINTENANCE

- A. Begin maintenance of areas immediately after each area is installed and continue until acceptable vegetative cover is established, but for not less than the warranty period.
 1. Seed & Sod Areas Areas: 90 days from date of Substantial Completion, or until Final Acceptance by Owners Representative, whichever is longer.
 2. When full maintenance period has not elapsed before end of planting season or if lawn is not fully established, continue maintenance during next planting season
- B. Maintain and establish areas by watering, weeding, reseeding, re-sodding, controlling pests and diseases, and other operations. Roll, regrade, and reseed/re-sod bare or eroded areas and remulch seeded areas to produce a uniformly smooth vegetative cover.
 1. Reseed/Re-sod bare areas with same materials specified for respective grasses.
 2. Add new mulch in seeded areas where mulch has been disturbed by wind or maintenance operations sufficiently to nullify its purpose. Anchor as required to prevent displacement.
 3. All areas and spots which do not show a prompt catch of grass or signs of browning shall then be reseeded or re-sodded as required until complete coverage is obtained.
- C. Watering: Provide and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep area uniformly moist to a depth of 4 inches.
 1. Lay out temporary turf-watering system and arrange watering schedule to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly seeded, plugged, or sprigged areas.
 2. Water or supplement natural rainfall to provide a minimum rate of 1 inch per week.
 3. All lawn areas shall be kept moist to maximize germination and root establishment. Water shall be applied frequently enough to keep the grass and soil from drying out. The University shall provide the water source. The contractor is responsible for hoses, sprinklers or other watering devices and he/she shall ensure proper backflow protection on the water source.
 4. To protect pedestrians any hoses that cross a sidewalk, walkway, or other pedestrian route must be bridged using a cable tray or other similar device in a manner that is ADA compliant

- D. When the average height of the grass is 3 to 4 inches, grass shall be cut to 2 to 3 inches or 1/3 of the grass blade. Any depressions or irregularities in the lawn surface shall be leveled off and reseeded or re-sodded.

1.9 ACCEPTANCE

- A. Conditions at end of Maintenance Period: lawn areas shall be free of insect, pest and disease damage.
- B. Lawn Areas. At the end of the maintenance period, a healthy, uniform, close stand of grass will have been established, free of weeds, invasive species and surface irregularities, with seeded lawn coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 2 by 2 inches.
- C. If lawn areas are deficient, the Contractor's responsibility for maintenance of all areas shall be extended until deficiencies are corrected. Areas to be corrected shall be prepared and reinstalled in accordance with the requirements of this Section. Owners Representative's inspection shall determine whether maintenance shall continue in any part.
- D. Following the correction of all punch list deficiencies, the Contractor shall request in writing that the Owners Representative formally inspect the work. If installation and workmanship are acceptable, the Owners Representative will issue a written acceptance and date of Substantial Completion.

1.10 CHEMICAL SPRAYING PROGRAM

- A. Chemical Spraying Program: No spraying of herbicides, insecticides, fungicides, nematocides, fumigants, or other chemicals shall be done without first submitting a spray program to the Owners Representative. Application of herbicides will only be permitted by licensed applicators. Applicators shall follow notification requirements of the University and consult any Chemical Hypersensitivity Registries for the area.

PART 2 - PRODUCTS

2.1 SEED

- A. Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.
 - 1. Seed Mixture: Provide seed of species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as required by PADOT seed mixes.
- B. Shall be clean and fresh, packed in sealed bags showing net weight, composition of mix, date of germination tests and supplier's name.
- C. Seed must be Blue Tagged Certified and must not contain more than 0.1% by weight weed seed, no more than 1.5% inert matter, no more than 0.2% other crop seed and no noxious weed seed or undesirable grass species.
- D. Lawn Seed shall be PADOT Formulas as indicated on Drawings

2.2 SOD

- A. The sod producer shall specialize in grass seed production with a minimum of 5 years' experience and shall be certified by the Pennsylvania Department of Agriculture as outlined in Title 3 (Agriculture) of the Pennsylvania Consolidated Statutes.
- B. Sod shall be a minimum of 18 months in age with root development that will support its own weight without tearing when suspended vertically by holding two adjacent corners.
- C. Composition of seed blend shall be a minimum of 3 different turf type tall fescue varieties, with a blended ratio of 20% to 40% of each variety for a total of 100%. Varieties shall represent the top 1/3 of performers in the most recent final or current year National Turfgrass Evaluation Program (www.ntep.org) for the Northeast USA. In addition, one of the varieties may be a rhizomatous type as advertised by the seed marketer. Seed mixture must be approved by the Owners Representative prior to purchase for seeding.
- D. The Owners Representative may request or allow a composition of seed blend with 3 different turf type tall fescue varieties and also a maximum of 10 % perennial ryegrass. The perennial ryegrass must follow the same specifications as other seeds mentioned in these specifications.
- E. The Owners Representative may request or allow compositions to include 10% bluegrass for stability purposes.
- F. Sod shall be field grown in same climatic conditions as that of the project site.
- G. Sod shall be strongly rooted, not less than 18 months old, free of weeds and undesirable native grasses. Sod must be capable of growth and development when planted.
- H. Sod shall be free of pests.
- I. Sod shall be installed within 24 hours from the time it is cut.

2.3 TOPSOIL

- A. Topsoil: ASTM D-5268, pH range of 6.2 to 6.7, 4 to 6 percent organic material (by weight), free of stones 1 inch or larger in any dimension, and other extraneous materials harmful to plant growth.
 - 1. Topsoil Source: Reuse surface soil stockpiled on the site. Verify suitability of surface soil to produce topsoil meeting requirements and amend when necessary. Supplement with imported topsoil, if needed, that is equal to amended stockpiled topsoil when quantities are insufficient, to meet project requirements, at no additional cost to Owner. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
- G. Do not export excess existing topsoil. Transport to University property as directed by Owners Representative.
- H. Topsoil shall not be muddy or frozen at time of grading as determined by the Owners Representative

2.4 SOIL AMENDMENTS

- A. Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent, with a minimum 99 percent passing a No. 8 (2.36 mm) sieve and a minimum 75 percent passing a No. 60 (250 micrometer) sieve.
 - 1. Provide lime in the form of natural dolomitic and/or calcitic limestone.
- B. Aluminum Sulfate: Commercial grade, unadulterated.
- C. Herbicides: EPA registered and approved, of type recommended by manufacturer.
- D. Water: Potable.

- F. Organic Matter: Fully composted and stable, per Section 329300 Plants.

2.5 FERTILIZER

- A. As recommended in the topsoil analysis.
 - 1. Each container of fertilizer and/or lime shall be labeled by manufacturer as separate items indicating weight and analysis of the container.

2.6 MULCHES

- A. Wood-Cellulose Mulch (Hydromulch): Specially prepared mixture of biodegradable, air-dried wood fiber manufactured from wood chips or bark, and shredded paper particles, comprised of recycled newsprint or other recycled cellulose fiber combined with a surfactant and nontoxic, green-dye; manufactured to be applied with hydraulic seeding equipment and meet the following requirements:

Wood Fiber	45% to 55%
Recycled Cellulose Fiber	45% to 55%
Moisture content	21% Maximum
Organic matter (oven-dried basis)	97% Minimum
Ash content	0% to 1.6%
Water holding capacity (grams H2O per 100 grams fiber)	1000% minimum

- 1. No straw or hay mulch will be accepted.
- 2. In areas with slopes >3:1 erosion control matting shall be used as approved by the Owners Representative
- 3. Mulch shall consist of especially prepared wood cellulose processed into a uniform fibrous physical state.
- 4. Mulch shall be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
- 5. Mulch shall contain no germination or growth inhibiting factors.
- 6. Mulch shall be manufactured and processed in a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with other additives to form a homogeneous slurry.
- 7. Mulch shall form a blotter-like groundcover, on application, having moisture absorption and percolation properties and shall cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
- 8. Mulch shall not contain elements or compounds at concentration levels that will be phytotoxic.
- 9. Mulch must conform to the following physical requirements and as listed above.
 - a. Fiber length to approximately 10 mm. Diameter approximately 1 mm.
 - b. pH range of 4.0-8.5
 - c. Ash content of 1.6% maximum

2.7 WATERING

- A. The Contractor shall be responsible for watering seeded and sodded areas during the maintenance period. Work that is injured or damaged due to the lack of water, or the use of too much water, shall be Contractor's responsibility to correct.

2.8 MEADOW SEEDING – as indicated on Drawings

2.9 FABRICS – as indicated on Drawings

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive turf and grass for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.
 - 1. Areas shall be free of waste or debris developed by other trades. Any discrepancy from such conditions shall be reported to the Owners Representative before beginning any installation.
 - 2. Prior to commencing any finished grading the Contractor shall notify the Owners Representative allowing enough time for a thorough inspection of the subgrade.
 - 3. Prior to any work the Contractor shall have all utilities located by calling PA One-Call at (800)242-1776.

3.2 GRADING

- A. Refer to Section 312000 Earth Moving for additional requirements.
- B. Prior to grading, apply Round-Up or other approved herbicide as per the manufacturer's directions to eliminate any existing weeds. Allow sufficient time for the herbicide to take effect.
- C. Perform finished grading necessary to bring site to required finished elevations indicated on the grading plan.
- D. If the general area is hard pan, the sub-grade shall first be rototilled or chisel plowed at least 12 inches deep to permit proper loosening, drainage, and preparation of the ground. The sub-grade shall be loosened and graded by harrowing, discing, or dragging, as dictated by the condition of the sub-grade. The entire sub-grade shall then be raked and stones over 1 ½ inches, grade stakes, rubbish, and general debris removed.
- E. A final inspection of the sub-grade by the Owners Representative is required before topsoil is spread.

3.3 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by seeding operations.
 - 1. Protect adjacent and adjoining areas from hydroseed overspray.
- 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.

3.4 PLANTING SOIL PREPARATION

- A. Limit subgrade preparation to areas that will be seeded in the immediate future.
 - 1. The Contractor shall grade turf areas indicated on the drawings. In the event there are discrepancies between the construction drawings and on-site conditions, the Contractor shall notify the Owners Representative before beginning any installation.
- B. Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter.
- C. Mix soil amendments and fertilizers with topsoil at rates indicated in the topsoil analysis. Delay mixing fertilizer if seeding does not follow placing of soil within a few days. Either mix soil before spreading or apply soil amendments on surface of spread topsoil and mix thoroughly into top 4 inches of topsoil before seeding and sod installation.
 - 1. Mix lime with dry soil before mixing fertilizer.
 - 2. Apply fertilizers and mix soil amendments as per soil test recommendations
 - 3. Immediately after lime and fertilizer application go over the entire area with a rototiller, or other approved piece of equipment and loosen surface at least 4 inches deep and then hand rake to a smooth even surface.
 - 4. Spread starter fertilizer uniformly at the rate determined by the soil test for new lawns.
- D. Spread planting mix to depth required to meet grades, and elevations shown, after light rolling and natural settlement. Do not spread if soil or subgrade is frozen.
- E. Preparation of Unchanged Grades (for areas of existing topsoil to remain undisturbed): Where areas are to be seeded or sodded in areas unaltered or undisturbed by excavating, grading, and surface soil stripping operations, prepare soil as follows:
 - 1. Till surface soil to a depth of at least 6 inches. Apply required soil amendments thoroughly into top 6 inches of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
 - a. Do not till at roots of existing trees to remain; rake amendments in lightly to top 1" of soil.
 - 2. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - 3. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property.
- F. Grade 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 seeded in the immediate future. Remove trash, debris, stones larger than 1-1/2 inches in any dimension, and other objects that may interfere with seeding or maintenance operations.
- G. Moisten prepared areas before seeding and sodding when soil is dry. Water thoroughly and allow surface to dry before seeding and sodding. Do not create muddy soil.
- H. Restore prepared areas if eroded or otherwise disturbed after fine grading and before seeding.
- I. Re-loosen soil in areas to be seeded and sodded if left for more than seven days to a depth of 4 inches.

3.5 SEEDING LAWN AREAS

- A. As soon as the ground has been properly prepared and approved for seed by the Owners Representative, sow seed, in two operations at right angles to each other, using a suitable mechanical seeder or sowing by hand for small area. 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.

- B. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.
- D. Sow seed at rates as required by PADOT for PADOT seed mixes specified on Drawings. Refer to Soil Erosion and Sediment Control Drawings and Specifications for additional information. For other mixes required or allowed by Owners Representative, seed at rate as approved by Owners Representative.
 - 1. PADOT Formula B: 44 lbs / 1,000 SY, unless a higher seeding rate is specified on Drawings.
 - 2. PADOT Formula L: 48 lbs / 1,000 SY, unless a higher seeding rate is specified on Drawings.
- E. Unless the seeder covers the seed with soil as it sows, rake to obtain a light covering of soil over the seed after sowing, then roll very lightly with an empty water roller.
- F. Do no seeding in adverse weather or in wet conditions.
- G. Rake seed lightly into top 1/8 inch (3 mm) of topsoil, roll lightly, and water with fine spray.

3.6 MULCHING

- A. General: Apply mulch to 100 percent of the areas requiring treatment as indicated on the Drawings. Mulch immediately after seeding or within 48 hours after completion of seeding. Contractor may mulch seeded areas.
- B. Do not apply mulch within 24 hours of forecast rainfall. Re-treat at the originally specified rates any mulched areas damaged by rain before materials have dried.
- C. Re-treat, at the same rate, any mulched areas damaged before acceptance at the Contractor's expense. If seed bed is destroyed, reseed at originally specified rates.

3.7 WOOD-CELLULOSE MULCH (HYDROMULCH)

- A. After seed application, wood cellulose fiber mulch shall be applied at a net dry weight of 1,500-2,000 lbs. per acre. The wood cellulose fiber mulch shall be mixed with water, and the mixture shall contain a maximum of 50 lbs of wood cellulose fiber per 100 gallons of water. In areas where erosion may be a problem, use an organic tackifier, erosion fabric, or approved equal in accordance with the manufacturer's instructions.
- B. Hydraulically apply wood-cellulose mulch with equipment approved by the mulch manufacturer.
- C. Avoid unnecessary spraying of adjacent surfaces and features, including plant stems and foliage. Remove mulch from pavement surfaces at the end of each work day.

3.8 SOD INSTALLATION

- A. Lay sod on the same day as delivery to prevent dehydration.
- B. Lay sod tight with no open joints visible, and no overlapping. Stagger end joints 12 inches minimum. Do not stretch sod pieces.
- C. Lay smooth and align with adjoining grass areas. Place top elevation of sod even with or slightly above adjoining edging, paving, or curbs to allow for settling.
 - 1. At interface with existing grass areas, apply lawn seed to disturbed and bare portions of the existing lawn to a 2-foot maximum wide area.

- D. On slopes exceeding 2 horizontal to 1 vertical (and as specified below), lay sod perpendicular to the slope and secure every row with biodegradable staples at maximum of 2 feet on center. Drive staples flush with soil portion of the sod.
 - 1. Use same stapling pattern for sod on this project, regardless of slope.
- E. Water sodded areas immediately after installation with enough moisture to ensure the entire rootmass and thatch areas are completely saturated.
- F. After sod and soil have dried, roll sodded areas to ensure a good bond between sod and soil and to remove minor depressions and irregularities.

3.9 FINAL INSPECTION AND ACCEPTANCE:

- A. Give 10 days' notice prior to Final Inspection. Final acceptance shall be granted provided grass areas are properly established and free of washouts, depressions, bare spots, weeds and large off-color areas. Silt socks or other erosion control devices shall be removed and their areas restored. Lawn area under this contract that is not in satisfactory condition, as determined by the Owners Representative, shall be reworked as soon as conditions permit. Reworked lawn areas shall be maintained as previously specified until final inspection and acceptance occurs.

3.10 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 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 throughout maintenance period until turf is established.

3.11 MEADOW SEEDING

- A. Follow recommendations of Ernst Seed Company unless stricter recommendations and higher seeding rates are indicated on Drawings and herein.

END OF SECTION 32 92 00