

SECTION 02938
GRASS SODDING

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Preparation and Placing of subsoil.
- B. Fertilizing.
- C. Sod installation.
- D. Maintenance.

1.2 SCOPE

- A. The work consists of performing all grass sodding and related work as indicated on drawings and described in this section.
- B. Unless otherwise indicated, the Contractor is responsible for the repair of any existing lawn areas disturbed during the construction process
- C. The Contractor is responsible for the irrigation of all lawn areas on the project, including those not covered by an irrigation system.
- D. The Contractor is responsible for the all maintenance to the Bermuda grass lawns during a minimum 2-month grow in period.

1.3 BERMUDA GRASS FIELD INSTALLER QUALIFICATIONS

- A. A contractor specializing in the grading and grassing of athletic fields shall grade and install the Bermuda grass field. The specialty contractor shall submit a list of athletic field projects successfully completed during the past three years, including a list of three similar Bermuda Grass sports field projects for the approval of the Architect and the Owner. Include information concerning the project Owner and references with telephone contact numbers.

1.4 REFERENCES AND RELATED DOCUMENTS

- A. ASPA (American Sod Producers Association) - Guideline Specifications to Sodding.
- B. FS O-F-241 - Fertilizers, Mixed, Commercial.
- C. Section 02200, Earthwork.
- D. The provisions of the General Conditions, Supplementary Conditions, and the Sections included under, Division 1, General Requirements, are included as part of this section.

1.5 DEFINITIONS

- A. Weeds: Include Crab Grass, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedges, Bindweed, Goose Grass, Crowfoot Grass, Torpedo Grass, Spurges, Spreading Dayflower, Guinea Grass, Bull Paspalum, Sandbur, Love Grass, Finger Grass, Paricum Grasses, Foxtail, Smut Grass, Amaranth, Chickweeds, Ragwood, Spanish Needles, Thistle, Horsetweed, Dogfennel, Cudweed, Hawksbeard, Dollarweed, Pepperweed, Beggarweeds, Sida, Oxalis, Pusley, Penneywort, Matchweed, and Punctureweed.

1.6 SUBMITTALS

- A. Provide submittals per section 01300.

- B. Provide submittals for the following products for the Architects approval of prior to start of work on the sodding.
 - 1. Fertilizer
 - 2. For the track infield area and all Bermuda grass fields, submit planting soil analyses of the existing and imported soils for approval at no additional cost to the Owner. If the soil composition within the track area is uniform, collect cores for a composition sample from approximately six dispersed areas and within the top 6" of the soil. The analysis shall show % of organic material in the soil through the loss on Ignition by Volume soil test method, indicate the soil pH and with recommendations from the testing laboratory for additional topsoil, fertilizer type and application rate, and other soil amendments necessary to bring the top 6" of soils in the Bermuda grass areas to the following specified levels:
 - a. Percolation rate: minimum 4" per hour in the top six inches of soil
 - b. PH level: 6.0 - 7.0
 - c. Soil Organic Content 5% minimum /20% maximum
 - d. Major and Minor nutrients as recommended by the laboratory
 - e. A South Florida agricultural testing laboratory acceptable to the Architect and the Owner shall perform all testing and recommendations.
 - 3. Herbicides
 - 4. Fire ant certification from the sod supplier
 - 5. Specialty grading and grassing contractor information as noted in Section 1.3 above.
- C. Section 01700 - Contract Closeout: Procedures for submittals.
- D. Operation Data: Submit for continuing Owner maintenance.
- E. Maintenance Data: Include maintenance instructions, cutting method and maximum grass height, types, application frequency, and recommended coverage of fertilizer.

1.7 QUALITY ASSURANCE

- A. Sod: Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.
- B. Submit sod certification for grass species and location of sod source.
- C. Sod Producer: Company specializing in sod production and harvesting with minimum five years experience, and certified by the State of Florida.
- D. Installer: Company approved by the sod producer.

1.8 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of fertilizer and herbicide mixture.
- C. Contractor shall follow all regulations, ordinance, and code governing the work, including but not limited to permitting and inspections.

1.9 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01600 - Material and Equipment: Transport, handle, store, and protect products.
- B. Deliver sod on pallets. Protect exposed roots from dehydration.
- C. All sod delivered to the site, shall be laid within 8 hours.

1.10 PROJECT CONDITIONS

- A. Contractor shall inspect the site and plans to become aware of the project conditions and requirements before submitting a bid.
- B. Section 01040 - Coordination and Meetings.
- C. Sequence installation to ensure orderly and expeditious utility connections.
- D. Coordinate with installation of underground sprinkler system pipe and watering heads.

1.11 CONTRACTOR SUPERVISION

- A. The Contractor shall provide a competent superintendent and any necessary assistants on the project when work is in progress.
- B. Do not change the superintendent during the project without the consent of the Architect unless the superintendent leaves the Contractor's employment.
- C. The superintendent shall represent the Contractor and in the Contractor's absence all directions given to him by the Architect shall be binding as if given to the Contractor.
- D. The Contractor's superintendent shall supervise the Contractor's employees on the job site and be responsible for their actions and conduct on the job site.

1.12 PROTECTION OF WORK AND PROPERTY

- A. The Contractor shall continuously maintain adequate protection of all his work from damage and shall protect the Owner's property from injury or loss arising in connection with his work.
- B. The Contractor is responsible for contacting the necessary entities to determine the locations of all underground utilities on the site.
- C. The Contractor shall take care to avoid damage to any existing buildings, equipment, piping, pipe coverings, electrical systems, sewers, sidewalks, landscaping, grounds, aboveground or underground installations or structures of any kind, and shall be responsible for any damage that occurs as a result of his work.
- D. Contractor shall adequately protect his work and all adjacent property as provided and required by law.
- E. Utilities noted on the plans are anticipated locations only. The utilities shown may not include all underground utilities on the site, and the locations indicated may not be as installed.

PART 2 PRODUCTS

2.1 GRASS SOD

- A. Sod shall be the recognized Argentine Bahia, St. Augustine Floratam, or Tifway 419 Bermuda, whichever is called for on the drawings.
- B. Argentine Bahia and St. Augustine sod shall have well matted with roots; shall have firm tough texture having a compact top growth and heavy root development. Bahia sod shall be sand based. St. Augustine sod shall be muck based. Both types of sod shall contain no significant amounts (more than 2% of canopy) of Bermuda grass, weeds or any other objectionable vegetation. The soil embedded in the sod shall be free from fungus, vermin and other diseases and shall have been mowed at least three times with an approved lawn mower with final mowing not more than 7 days before the sod is cut. The sod shall be taken up in commercial size rectangles measuring 16" x 24". The soil base of the sod shall be of a uniform thickness.
- C. Tifway 419 Bermuda sod shall have well matted with roots; shall have firm tough texture having a compact top growth and heavy root development. Bermuda sod shall be sand based, and contain no weed of any type. The soil embedded in the sod shall be free from fungus, vermin and other diseases and shall have been mowed no more than 4 days before the sod is cut.

The sod shall be taken up in rolls sized 42" wide and 75' long. Remove all netting from the back of the sod prior to installation. The soil base of the sod shall be of a uniform thickness.

- D. Sod shall be sufficiently thick to insure a dense stand of live grass. Sod shall be live, fresh, and uninjured at the time of planting. Plant sod within 48 hours after harvesting.
- E. Use only sod certified free of fire ants. Before delivering any sod to the project, the Contractor shall furnish to the Owner and the Architect written certification from the supplier that the sod is free of fire ants.

2.2 COMMERCIAL FERTILIZERS

- A. Commercial fertilizer shall comply with the State Fertilizer Laws. Numerical designation for fertilizer indicates the minimum percentage respectively of (1) total nitrogen, (2) available phosphoric acid, and (3) water soluble potash contained in the fertilizer.
- B. Fertilizer for Bermuda grass shall be 15-5-15 with the rate and minor nutrients as recommended by the agricultural laboratory performing the tests on the project topsoil.
- C. Fertilizer for Bahia and St. Augustine grass shall be 8-8-8-with appropriate minor nutrients applied at the rate of 16 pounds per 1000 square feet.

2.3 WATER

- A. Contractor shall supply and apply all water.

2.4 ROLLER

- A. Contractor shall use a roller(s) appropriately sized to achieve the required lawn surface grade.

2.5 FERTILIZER SPREADER

- A. Contractor shall use a device for spreading the fertilizer capable of uniformly distributing the material at required rates.

2.6 HERBICIDES

- A. The Contractor shall select, provide, and apply all herbicides as required.

2.7 TOPSOIL

- A. Topsoil for Bermuda Tifway 419 Lawns: If required, additional topsoil shall be as required by the recommendations of the agricultural laboratory performing the analysis of the project soil.
- B. Topsoil for St. Augustine Floratam Lawns: Topsoil shall be comprised of 50% sand and 50% organic muck by volume. Topsoil shall be as provided by Atlas Peat and Soil, Inc. - Mix 5050, or other equivalent manufactured soil mixture accepted in writing by the Architect. To propose a substitute, the Contractor shall provide verification from an approved agricultural testing laboratory that the substitute meets the required 50/50 ratio.

2.8 SOIL FUMIGANTS

- A. The Contractor shall select and provide soil fumigants as required to eradicate all soil organisms, all existing vegetation, and all plant seeds and other forms of plant regeneration.
- B. Use all soil fumigants and other materials as specified and recommended by the manufacturer(s). All soil fumigants shall be suitable for their intended purpose.

PART 3 EXECUTION

3.1 EXAMINATION

- A. The Contractor and his Bermuda grass installer shall coordinate and attend a pre-work meeting with Florida Tech personnel prior to any Work.
- B. Verify that prepared soil base is ready to receive the work of this section.

3.2 GENERAL: The order of work for sod installation shall be as follows:

- A. Bahia Grass Lawns:
 - 1. Removal of debris and existing vegetation not noted to remain.
 - 2. Roto-tilling of all compacted areas.
 - 3. Subgrading.
 - 4. Removal of additional debris as required.
 - 5. Fine grading.
 - 6. Placement of sod.
 - 7. Clean up.
 - 8. Watering.
 - 9. Maintenance (including watering of all areas regardless of whether or not a sprinkler system has been installed).
 - 10. Application of fertilizer 30 days after installation of sod.
 - 11. Rolling of sod as soon as practical.
- B. St. Augustine Floratam Lawns
 - 1. Removal of debris and existing vegetation not noted to remain.
 - 2. Roto-tilling of all compacted areas.
 - 3. Subgrading.
 - 4. Installation of muck topsoils.
 - 5. Roto-tilling of muck topsoil into the existing soils.
 - 6. Removal of additional debris as required.
 - 7. Fine grading.
 - 8. Placement of sod.
 - 9. Clean up.
 - 10. Watering.
 - 11. Maintenance (including watering of all areas regardless of whether or not a sprinkler system has been installed).
 - 12. Application of fertilizer 30 days after sod installation.
 - 13. Rolling of sod as soon as practical.
- C. Bermuda Grass Lawns:
 - 1. Roto-tilling of all compacted areas.
 - 2. Laser subgrading.
 - 3. Installation of topsoil and other soil amendments.
 - 4. Roto-tilling of topsoils and amendments into the existing soils.
 - 5. Removal of debris as required.
 - 6. Soil fumigation.
 - 7. Final laser grading in accordance with specific elevations noted in the civil engineering grading plans.
 - 8. Placement of sod.
 - 9. Clean up.
 - 10. Watering.
 - 11. Beginning of required grow-in period and maintenance.

12. Application of fertilizer four and eight weeks after installation.
13. Rolling of sod approximately four weeks after installation.

3.3 ROTO-TILLING:

- A. Roto-till all lawn areas that have become compacted during the construction process as required to assure adequate percolation of water through the soil.

3.4 SUBGRADE:

- A. Prepare subgrade for all areas receiving sod, as required to produce the finish grades indicated on the grading plans and specifications.
- B. Remove all existing shell rock or other road base that encroaches more than 12" into any lawn area, and fill any voids cause by road base removal with clean, well draining, and properly compacted planting soil

3.5 INSTALLATION OF TOPSOIL AND SOIL AMENDMENTS

- A. Install additional topsoil and other soil amendments in Bermuda grass areas as required to accommodate the required grades and the recommendations of the testing laboratory. Roto-till all materials into the existing soil until the top 6" of soil is a homogeneous mixture.
- B. Install a minimum 2" thick layer of topsoil in all areas receiving St. Augustine Floratam sod. Roto-till all topsoil into the existing soil until the top 4" of soil is a homogeneous mixture.

3.6 REMOVAL OF DEBRIS

- A. Clean areas receiving grass of all stones larger than ¼ inch in diameter, sticks, stumps, paper, glass and other debris. Kill by herbicide and remove all weeds or existing grasses from areas to receive sod.

3.7 FUMIGATION OF THE BERMUDA GRASS LAWN AREAS

- A. The Contractor shall fumigate the lawn areas receiving Bermuda grass to eradicate all soil organisms, all existing vegetation is, and all plant seeds and other forms of plant regeneration. The Contractor shall use a soil fumigation method that guarantees all vegetative matter and soil organisms in the soil are eradicated. Use all soil fumigants and other materials as specified and recommended by the manufacturer(s).

3.8 FINE GRADING

- A. After removal of debris, perform fine grading as required to bring all areas to receive grass to a smooth, even, and finished grade. Use a laser grader to fine grade areas receiving Bermuda grass. Fine grade other areas receiving grass by raking to eliminate wind rows, ridges, depressions and other irregularities. The Contractor shall fine grade areas receiving sod as necessary to achieve a finished grade (top of the sod) as specified in this section.
- B. All sodded areas bordered by sidewalks, asphalt pavement, or curbs shall have a finished grade (top of the sod's soil) that is flush (or less than ½" below) with the grade of the adjacent sidewalk, asphalt pavement, or curb.
- C. All sodded areas bordered by planting areas shall have a finished grade (top of the sod's soil) that is 1½" above the soil level in the adjacent planting bed.

3.9 PLACING OF SOD

- A. The setting of pieces shall be staggered in such a manner as to avoid continuous seams. Sod shall be moist and placed on a moist earth bed. Carefully place sod by hand, edge to edge in rows at right angles to the slope, starting at the base of the area and working upward. On St. Augustine and Bahia lawns, install only full size (16" x 24") pieces of sod (except for cutting-in purposes). There shall be no voids between sod pieces, no overlapping of the edges of sod pieces, and the finished grade of all sodded areas smooth and even. Use clean sand to fill any developing voids or unevenness in the sod surface. Unless otherwise indicated by the grading plans, the Contractor shall ensure that the finished grade of sod does not vary more than 2" from a 10' long straight edge.
- B. Place Bermuda grass sod field as required to produce a smooth and even surface conforming to the grades indicated on the project civil engineering plans. All field areas shall be laser graded as required to produce the required surface finish. The Contractor shall ensure that the finished grade of sod does not vary more than ¼" from a 10' long straight edge. Remove any mesh backing on the Bermuda grass from the sod and from the project site.
- C. Carefully place sod located on slopes so that rolling with a power roller is not necessary. Contractor may stake sod located around retention areas, along pavement areas or in swales. The Contractor is responsible for the repair of any erosion or relocation prior to the sod firmly rooting into the existing soil. Stakes, if used, shall not interfere with walking on, or the mowing of, the sodded areas.
- D. The Contractor shall ensure that the finished grade of sod placed directly adjacent to buildings or other walls does not vary more than 2" from a 10' long straight edge.

3.10 CLEAN UP

- A. Remove all debris, fertilizer bags, pallets etc. from the site upon completion of the work. Thoroughly sweep any paved areas including curbs and sidewalks.

3.11 WATERING

- A. Watering of the sodded areas is the Contractor's responsibility.
- B. Water sources shall be available and in operation prior to sodding for watering sodded areas.
- C. If the permanent irrigation system is not available under this contract, the Contractor shall provide temporary irrigation facilities for watering as required to establish and maintain turf areas in a healthy and green condition. The Contractor shall provide water for areas of this work not covered by an irrigation system.

3.12 APPLICATION OF FERTILIZER

- A. Apply fertilizer as previously specified. The rate of application for St. Augustine and Bahia grass shall be approximately 16 pounds per 1000 sq. ft. The rate of application for Bermuda grass shall be as recommended by the agricultural testing laboratory. Uniformly apply the fertilizer over the area receiving grass by using an approved distribution device calibrated to distribute the appropriate quantity. Do not fertilize when the wind velocity exceeds 15 miles per hour.
- B. Fertilize St. Augustine and Bahia sod 30 days after installation, and request an inspection to verify the application of the fertilizer.
- C. Fertilize Bermuda sod both 30 and 60 days after installation, and request an inspection to verify the application of the fertilizer.

3.13 Rolling and Topdressing of the Sod:

- A. Within one month of the laying the sod pieces, firmly press the sod into contact with the sod bed by rolling with a suitably sized mechanical roller or other approved equipment. The rolling operation shall provide a smooth and even surface conforming to the grades shown on the grading plan, and insure knitting of sod without displacement of sod or deformation of the surfaces.
- B. All developed unevenness or depressions in the lawn surfaces shall be top dressed as required to achieve a smooth and even finish. Top dressing shall not be applied more than 1" thick. In the case that the lawn surface requires more than 1" of correction, remove, re-grade, and re-sod the uneven areas.

3.14 GUARANTEE AND REPLACEMENT

- A. Contractor shall guarantee all sod work up until the end of the maintenance period. Contractor shall replace any defective or distressed grass materials at no additional cost to the Owner. During the guarantee period, it shall be the Contractor's responsibility to immediately replace any dead material.

3.15 COMPLETION AND ACCEPTANCE

- A. Completion of work shall mean full compliance and conformity with the provisions expressed or implied in drawings and in the specifications. Upon satisfactory completion of the work, the Architect will perform an inspection of the work to determine if the sodding work is ready for acceptance.

3.16 MAINTENANCE PROVISIONS - ST. AUGUSTINE AND BAHIA GRASS

- A. The Contractor shall be responsible for complete maintenance of all St. Augustine and Bahia lawn areas until "Substantial Completion" of the project or final acceptance of the landscape and irrigation work by the Owner and the Architect, whichever is later. Maintenance shall include, but not be limited to:
 - 1. Mowing all lawn areas no less than every other week, and the removal of all visible amounts of grass clippings from the lawn areas. Do not allow the lawn to exceed 5" in height for St. Augustine grass and 8" in height for Bahia grass.
 - 2. Edging of all walks, roadways, and planting beds no less than every other week.
 - 3. Eradication of all harmful insects (including ants).
 - 4. Control of all lawn and soil diseases.
 - 5. Watering and fertilizing as specified, and as required to maintain all lawn areas in a good condition for plant growth. Grass is required to be in a healthy and green condition at the time of final acceptance.
 - 6. Eradication of all weeds in the lawns as necessary for the grass to conform to the specification in paragraph 2.1.

3.17 MAINTENANCE PROVISIONS - BERMUDA GRASS

- A. The Contractor shall be responsible for complete maintenance of all bermuda grass until:
 - 1. Final acceptance of the landscape and irrigation work by the Owner and the Architect, or
 - 2. Two months after completion of the Bermuda grass lawn installation whichever is later.
- B. Maintenance shall include, but not be limited to:

1. Mowing all lawn areas no less than every week, and the removal of all visible amounts of grass clippings from the lawn areas. Do not cut the lawn in more than 1/4" increments. Mow Bermuda grass to an approximately 3/4" height.
2. Edging of all pavements and curbs no less than every week.
3. Eradication of all harmful insects (including ants).
4. Control of all lawn and soil diseases.
5. Watering and fertilizing as required to maintain all lawn areas in an excellent condition for plant growth and sports field use. Grass is required to be in a healthy and green condition at the time of final acceptance.
6. Eradication of all weeds in the lawns as necessary for the grass to conform to the specification in paragraph 2.1.
7. All other work as necessary for the specialty Contractor to ensure a high quality sports field turf.

END OF SECTION