

## SPORTS FIELDS CONSTRUCTION

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

#### 1.2 RELATED SECTIONS

- A. Section 02211 – Grading

#### 1.3 DESCRIPTION OF WORK

- A. Construction and Fine grading (laser grading) of sports fields.
- B. Sodding of sports fields.
- C. Maintenance of sports fields.

#### 1.4 SUBMITTALS

- A. Certification: Submit certificates of inspection as required by governmental authorities. Submit manufacturers or vendors certified analysis for sod, sand, organic soil amendments, herbicides, lime, and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.
- B. Soil Material Sample: Submit manufacturers' or vendors certified analysis and samples along with supporting literature for the following:
  - 1. Processed Sand
  - 2. Organic Soil Amendment
  - 3. Root Zone Mixture
- C. Fertilization Soil Testing Results: The Contractor shall take and pay for soil samples following sand and organic soil amendment from multiple areas of the field (minimum 5) and have them analyzed by the local Agricultural Extension Service (allow 10 to 14 calendar days for results) . The results of the analysis shall assist in determining the best fertilizer type and rate to use. The written results shall be provided to both the Owner and Landscape Architect, prior to purchase and application, with the results and the type of fertilizer (Type, Brand, and contents) for Owner and Landscape Architects' approval.
- D. Subsurface Drainage Materials

## 1.5 DEFINITIONS

- A. Sub-Surface Soil: That soil directly below the topsoil being existing in place soil and/or properly compacted imported soil, both being stable as a supporting medium and acceptable as a part of a rootzone for sports field construction.
- B. Rootzone Mixture: The combination of soil amendments (including fertilizer and lime) and sand blended into a homogeneous mixture. The rootzone mixture shall be mixed off-site to a uniform consistency using a mechanical blender designed for producing high performance sand based rootzones. Refer to PART 2 – PRODUCTS AND MATERIALS.
- C. Organic Soil Amendment: Refer to PART 2 – PRODUCTS AND MATERIALS.
- D. Laser Grading: The use of a land leveler implement that is equipped with a laser controlled hydraulic system that automatically raises and lowers the implement to achieve precision grading. This implement shall be towed by an agricultural type tractor to reduce soil compaction. Laser grading shall be a multiple step process beginning with the subgrade and continuing with each lift. Each individual lift shall be provided with the laser grading process and shall meet the specified tolerance to desired slopes and elevations.

## 1.6 QUALITY ASSURANCE

- A. Complete construction of sports fields shall be performed by a qualified Sports Field Contractor.
  - 1. Only Sports Field Contractors that have had the education, experience and training along with the following qualifications will be considered:
    - a. The Sports Field Contractor shall be a specialty contractor whose primary business is the construction of athletic fields. The Sports Field Contractor shall have built and completed two (2) similar projects, two inch to twelve inch (2"–12") depth sand based rootzone fields, specifically, and not natural soil fields with sand added as an amendment, during the last five (5) consecutive years; said projects shall have been performed by and only by the actual Sports Field Contractor that is submitting this bid. Further, prior work performed as a subcontractor involving only part of directed field construction on such previous projects shall not be considered.
    - b. The Sports Field Contractor shall perform all required work related to the sports field with staff supervision and employees, using company equipment either owned or leased without the subcontracting of any of the said required work. However, the Sports Field Contractor shall be allowed to subcontract irrigation, fencing, drainage and concrete construction as long as the Sports Field Contractor directly coordinates and supervises the subcontractor(s).

- c. The Sports Field Contractor's use of laser technology shall include laser controlled, hydraulically activated land plane, tractors, disc harrows and other specialized sports field construction equipment.

## PART 2 – PRODUCTS

### PART 2 – PRODUCTS AND MATERIALS.

#### 2.1 SAND

- A. USGA Greens sand or sand meeting the USGA specifications per particle size and shape analysis. Sand of soft origin, such as limestone, coral and other calcareous materials shall not be used. The sand shall be free of organic and foreign materials and conform to the following Particle Size Criteria and Physical Properties shall be as shown in Tables 1 and 2 below:

**See Table on Next Page:**

**Table 1. Particle Size Distribution of USGA Root Zone Sand**

Size	Sieve Mesh	Particle Diameter (mm)	Recommendation (By Weight)
Gravel	10	2.0-3.4	Not more than 10% of the total particles, including a maximum of 3% fine gravel (preferably none)
Very Coarse Sand	18	1.0-2.0	
Coarse Sand	18	0.5-1.0	Minimum of 60% of particles shall fall in this range
Medium Sand	60	0.25-0.50	
Fine Sand	100	0.15-0.25	Particles in this range shall not exceed 20%
Very Fine Sand	270	0.05-0.15	Particles in this range shall not exceed 5%
Silt		0.002-0.05	Particles in this range shall not exceed 5%
Clay		Less than 0.002	Particles in this range shall not exceed 5%

\*Total of Very Fine Sand, Silt, and Clay shall not exceed 10%

**Table 2. Physical Properties of the Root Zone Sand**

PHYSICAL PROPERTIES	RECOMMENDED RANGE
Total Porosity	35-55%
Air Filled Porosity (40cm Tension)	15-30%
Capillary Porosity	15-25%
Bulk Density	1.2-1.6 g/cc
Saturated Conductivity	9-18 inches/hr
Organic Matter Content (by weight)	1-5% (ideally 2-4%)

## 2.2 Organic Soil Amendment

- A. Organic Soil Amendment shall consist of quality compost manufactured by a composter enrolled in the United States Compost Council's (USCC) Seal of Testing Assurance (STA) Program.
- B. Organic Soil Amendment shall be EARTH Food™ as manufactured/prepared by EARTH Products, LLC, PO Box 2892, Peachtree City, GA 30269, 770-487-6677 or approved equal.

- C. Manufacturer shall provide certification that compost has matured for a minimum of ninety (90) days to minimize odor.

<u>Plant Nutrients</u>	<u>% Dry Weight</u> <u>Basis</u>	<u>TMECC</u> <u>Method</u>
Nitrogen	> 1.20	4.02D
Phosphorus	> 0.50	Calc.
Potassium	> 0.50	Calc.
Calcium	> 0.90	4.05
Magnesium	> 0.20	4.05
Organic Matter Content	> 50%	5.07-A
Soluble Salts dS/m (mmhos/cm)	< 4.0	4.08-A
Particle Size % under 9.5 mm	95% or greater	2.02-B
Stability Indicator (respirometry) CO <sub>2</sub> Evolution mb CO <sub>2</sub> -C/g OM/day	< 2	5.08-F777
Maturity Indicator (bioassay) Percent Emergence	85% or greater	5.05-A
Relative Seedling Vigor	85% or greater	
Select Pathogens (pass/fail per US EPA Class A standard, 40 CFR 503.32(a))	Pass	Standard Method 9221E

- D. Compost shall meet the above parameters as tested by an STA approved lab using the Test Methods for Evaluating Compost and Compost Manufactures (TMECC) method.

## 2.3 ROOTZONE MIXTURE

- A. Rootzone mixture shall consist of Ninety percent (90%) sand and Ten percent (10%) Organic soil amendment. The rootzone mixture shall be mixed off-site to a uniform consistency using a mechanical blender designed for providing high performance sand based rootzones.

## 2.4 LIME

- A. Dolomitic lime, stone ground to meet agricultural standards containing a minimum of eighty-five percent (85%) carbonates. Apply at rates recommended in soil tests provided by Sports Field Contractor.

## 2.5 FERTILIZER

- A. A commercial mixed grade fertilizer of 5-10-15; 5% nitrogen, 10% phosphoric acid, 15% potash.

## 2.6 SOD

- A. Certified Blue Tag sand grown Tifway 419 as certified by the Georgia Crop Improvements Association, Inc. The sod shall be harvested from vigorously growing, properly fertilized field(s) with at least one full growing season prior to harvesting. Sod shall be harvested in forty-two inch (42") width rolls or larger and the harvest netting (if applicable) shall be removed prior to installation. Certification tags shall be provided to the Owner at the completion of the sod installation.

## 2.7 Herbicide

- A. General Herbicide: Roundup ProMax as manufactured by Monsanto Company, 800 N. Lindbergh Blvd., St. Louis, MO., 63167 Phone: (314) 694-1000 or approved equal product shall be used to kill existing grass and weeds, applied according to manufacturer's instructions, using manufacturers recommendation for adequate time waited prior to sports field stripping and renovation work.

## 2.8 Pre-Emergent Herbicide Weed, Broadleaf, and Crabgrass

- A. "Preen" Crabgrass Preventer ([www.preen.com](http://www.preen.com)) or approved equal (with active ingredient Dithiopyr 0.13% minimum) as manufactured by Lebanon Seaboard Corporation, 1600 East Cumberland Street, Lebanon, PA. 17042 Phone (800)233-1067, or approved equal.
- B. "Preen" Broadleaf Weed Control ([www.preen.com](http://www.preen.com)) or approved equal [with active ingredient 2,4-dichlorophenoxyacetic acid 1.37%, (+)-(R)-2-(2 methyl-4-chlorophenoxy) propionic acid 0.31% and Dicamba:3,6-dichloro-o-anisic acid 0.13%] as manufactured by Lebanon Seaboard Corporation, 1600 East Cumberland Street, Lebanon, PA. 17042 Phone (800)233-1067, or approved equal.

## 2.9 Water

- A. Water used during the installation, "grow-in", and Maintenance period shall be provided and paid for by the Contractor. Sports Field Contractor shall be responsible for appropriate water application. Water utilized shall be suitable for irrigation and free from ingredients harmful to plant life.

## PART 3 – EXECUTION

### 3.1 SUBGRADE, ROOTZONE PREPARATION, AND SOD INSTALLATION

#### A. The Sports Field Contractor shall:

1. Meet with the Landscape Architect and Owner's Representative(s) before any work is initiated for review and general coordination procedures.
2. Cut and remove existing vegetation from site (if applicable).
3. Apply general herbicide, Roundup ProMax or approved equal to existing areas where vegetation has been removed, if applicable. Follow manufacturer's instructions. Allow and follow manufacturer's recommendation for length of time for herbicide to work on existing vegetation which is to be eliminated.
4. Upon establishment of subgrade to within one tenth (1/10) foot elevation, Sports Field Contractor shall till the field(s) with a disc harrow and PTO driven tiller implement six to eight inches (6"-8") into the sub-surface a minimum of three (3) times.
5. Laser grade the subsurface to within +/- one-half (½") inch of the designated slopes and elevations.
6. Remove all rocks, stones, sticks, and other debris over three quarters (¾) inches in size via perpendicular passes (minimum two passes) by a Harley Rake, Rockhound attachment (or equivalent) and hand raking as required to leave the sub-surface soil reasonably free of such miscellaneous matter. Remove debris from site.
7. Install all irrigation lines, valve boxes, electric controls, wiring, subsurface drainage system and all pipe trenches. Compact disturbed trench areas to prevent settling. The depth and height of installation is subject to final grade.
8. Remove small loose rocks, stone and debris, using a Harley Rake Machine or equivalent as required, thereby causing the sub-surface soil to be reasonably free of such miscellaneous matter. Remove debris from site.
9. Add three (3) inch lift of rootzone mixture to identified sports field areas, including safety zones, and laser grade to evenly distribute the rootzone mixture within one-half (½") inch of the designated slopes and elevations.
10. Add, subject to soil test analysis, lime and one application of fertilizer (minimum of one ton (1T) of 5-10-15 fertilizer per acre per application). Till in fertilizer and lime to three (3) inches deep.
11. Add three (3) inch lift of rootzone mixture to identified sports field areas, including safety zones, and laser grade to evenly distribute the rootzone mixture within one-quarter (¼") inch of the designated slopes and elevations.

12. Install the sprinkler heads as related to the surface at the appropriate elevation for sodding and carefully re-compact around the heads to prevent future settling. The irrigation system shall be tested and its proper operation thoroughly confirmed and demonstrated prior to sod installation.
13. Final water settled and compacted depth of rootzone mixture shall be six (6) inches. After sprinkler heads are set, the Sports Field Contractor shall verify grades established during the final laser grade preparation prior to the beginning of sod installation as being true finish contours shown and maintain such areas until the effective date to begin installation of sod. It shall be the responsibility of the Sports Field Contractor to maintain a suitable grade (within one-quarter ( $\frac{1}{4}$ ) inch of the designated slopes and elevations) for sodding, including but not limited to hand grading (to string line) if required.
14. Initiate the installation of sod in the areas defined on plans.
15. Immediately after sodding certain sections of the field(s), the irrigation system shall be activated through each appropriate zone on a five to ten (5-10) minute cycle until the ground is thoroughly wet. The watering shall be the responsibility of the Sports Field Contractor during the installation, "grow-in", and maintenance period. Subsequent watering, as well as maintenance (after the identified maintenance period) shall be the sole responsibility of Owner. As part of the Sports Field Contractor's maintenance program, the sod shall be kept moist until rooting occurs and then irrigated on a three (3) day per week cycle, subject to site and current weather conditions.
16. Roll Sod with smooth drum-double drum roller with a minimum weight of 3000 lbs. within seven (7) days of sod installation. Flag all irrigation heads prior to rolling sod. Roll sod in two perpendicular directions.
17. Roll Sod within seven (7) days of sod installation. Sod roller shall be minimum 48" wide smooth drum turf roller (minimum weight 1,500 lb) with effective ground pressure minimum 8 psi and maximum 12 psi. Flag all irrigation heads prior to rolling sod. Roll sod in two perpendicular directions.
18. Initial Topdressing of Sportsfield: After laying, watering and rolling sod, topdress with rootzone mixture to fill in joints between sod edges in a manner so as to focus the topdressing material directly on the joints. Depth of topdressing shall not bury or smother the sod. Apply both crabgrass preventer and broadleaf weed control.
19. Maintenance Topdressing: In addition to the initial topdressing during the sod installation, at least two full coverage lifts of  $\frac{1}{4}$  inch shall be performed by the Sports Field Contractor during the required Maintenance Period of Active Growth. The first one at 2-3 weeks after installation of sod and the second at 6-8 weeks after initial installation of sod (performed during Bermuda growing season or as requested by the Owner). Topdressings required shall use the same rootzone mixture as specified previously. Additional topdressings may be necessary for the optimum growth and maintenance of the field during grow-in



and will be assessed by the Landscape Architect, Owner and the Sports Field Contractor.

### 3.2 MAINTENANCE

- A. Sports Field Contractor shall maintain fields for a minimum of ninety (90) calendar days of active growing season (starting from the date of substantial completion certificate (the date of substantial completion shall be determined by the Project Landscape Architect and Owner)) to assure a healthy and vigorous stand of grass and shall provide Owner with full instructions and review of irrigation system (with irrigation sub-contractor) for the subsequent care by the Owner.
- B. Sports Field Contractor shall maintain the fields for a minimum of ninety (90) growing season calendar days following substantial completion. The maintenance period shall be continuous and include all maintenance during non-growing season if ninety (90) growing season calendar days are not completed in one growing season. The growing season shall commence on March 15 and Conclude on October 1st. Growing season maintenance calendar days not completed prior to October 1st shall be carried over until the start of the following growing season. If required growing season maintenance period is not completed in one growing season, all maintenance between October 1st and March 15th shall also be the responsibility of the Sports Field Contractor (in compliance with 12 month maintenance plan to be provided by Sports Field Contractor). Maintenance shall consist of watering, mowing, replanting, fertilizing, maintaining infield, topdressing, etc. Grass shall be mowed at a height of one inch (1") and mowing shall occur when the grass reaches a height of one and one half inch (1 ½") or once per seven (7) calendar days during the growing season. No more than 1/3 of the biomass shall be removed via cutting at any one time. Maintenance contractor (if different from the Sports Field Contractor) shall be pre-approved by the Landscape Architect and Owner. The Sports Field Contractor shall be responsible for guaranteeing the sod for one hundred twenty (120) calendar days following the start of the end of the maintenance period.
- C. Provide the Owner's Representative with a twelve (12) month Maintenance Plan, including but not limited to fertilization, weed control, watering, aerating, topdressing, and mowing. Any written maintenance plan prepared in advance is subject to current site and weather conditions.

### 3.3 CLEANUP

- A. Police and clean up the entire project so that excess soil, sand, containers and debris are removed.

END OF SECTION