

**SECTION 329117**  
**ATHLETIC FIELD NATURAL GRASS ROOT ZONE**

**PART 1 GENERAL**

**1.01 Section Includes**

- A. Materials and installation of sand cap root zone system.
- B. Installation of soccer goal anchors and verification of goal elevations.

**1.02 Related Requirements**

- A. Section 311000 - Site Clearing.
- B. Section 312217 - Athletic Field Natural Grass Subgrade
- C. Section 329227 - Athletic Field Sod Installation

**1.03 Definitions**

- A. Sports Field Contractor: Contractor that specializes in athletic field construction and meeting the requirements in the Quality Assurance section below.

**1.04 Reference Standards**

- A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine And Coarse Aggregates; 2014
- B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)); 2012
- C. ASTM F1632 Method B
- D. ASTM F1647 Method A

**1.05 Submittals**

- A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.
- B. Project Schedule: Critical path schedule showing start and completion of each phase of work being performed by the Sports Field Contractor.
- C. Submit the following within 48 hours of bid opening:
  - 1. List of most recent installation/reference for all projects of similar scope to this project completed in the last ten (10) years (see requirements in Quality Assurance below).
  - 2. Resume and current American Sports Builder Association (ASBA) Certification of proposed Certified Field Builder (CFB).
- D. Conformance survey of finished root zone elevations (see Field Quality Control below).
- E. Materials Sources: Submit name of imported materials source.
- F. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- G. The Sports Field Contractor shall submit to Owner a one-gallon sample of the proposed USGA sand to be used for the root zone. This sample shall be a composite sample taken from the material stockpile allocated for this work by the supplier. A minimum of eight (8) sampling locations shall be randomly selected from the stockpile, varying from the top, to bottom, and all around the pile. At least half of the samples should be taken from the lower third of the stockpile, and none should include material from the outer six (6) inches of the pile where fines have been washed out. The sample is to be labeled to clearly identify which stockpile the sample was taken.

- H. The Sports Field Contractor shall submit samples of the proposed USGA sand and of the existing field root zone sand to Turf & Soil Diagnostics, 613 East 1st Street, Linwood, KS, 66052. Testing should include gradation/particle size per USGA Root Zone Materials (see below), Acid Reaction, Uniformity Coefficient, D15, D50, and D85 for compatibility and bridging ability. Proposed sand sample is to be obtained at the same time as the sample provided to the Owner as outlined above. Existing field sand is to be a composite sample obtained from a minimum of eight (8) locations across the field and samples must be from below the existing organic zone and from clean sand.

#### 1.06 Quality Assurance

- A. All material approvals must be obtained prior to delivery of materials to the site.
- B. The Sports Field Contractor shall be responsible for all work associated with this specification section, and meet the following requirements:
1. Be an active member of the American Sports Builder Association (ASBA) with a minimum of one (1) Certified Field Builder (CFB) on staff who will be on site and responsible for all work performed within this section.
  2. Have experience in successfully constructing and renovation of sand based or sand capped athletic fields under the current company name and ownership.
  3. Have successfully completed a minimum of five (5) NCAA Division 1, NFL, MLS or MLB sand based or sand capped natural grass fields in the past ten (10) years.
  4. All grading equipment shall be high-floatation, turf tire or low ground pressure agricultural equipment. Fully automatic laser controlled grading box or blade should be used to achieve the specified tolerance from the required elevations.

### PART 2 PRODUCTS

#### 2.01 Materials

- A. USGA Root Zone Materials
- |                      |                                 |
|----------------------|---------------------------------|
| 1. Fine Gravel:      | 2.0 to 3.4mm particle size      |
| 2. Very Coarse Sand: | 1.0 to 2.0mm particle size      |
| 3. Coarse Sand:      | 0.5 to 1.0mm particle size      |
| 4. Medium Sand:      | 0.25 to 0.50mm particle size    |
| 5. Fine Sand:        | 0.15 to 0.25mm particle size    |
| 6. Very Fine Sand:   | 0.05 to 0.15mm particle size    |
| 7. Silt:             | 0.002 to 0.05mm particle size   |
| 8. Clay:             | less than 0.002mm particle size |
- B. USGA Root Zone Mix:
1. Fine Gravel and Very Coarse Sand: Maximum of 10% by weight with maximum of 2% Fine Gravel.
  2. Coarse and Medium Sand: Minimum of 60% by weight
  3. Fine Sand: Maximum of 20% by weight
  4. Very Fine Sand: Maximum of 5% by weight
  5. Silt: Maximum of 5% by weight
  6. Clay: Maximum of 3% by weight
  7. Total Fines (very fine sand + silt + clay): Maximum of 10%
- C. USGA Root Zone Properties:
1. Capillary porosity (40cm tension): 15% to 25%
  2. Air filled porosity (40cm tension): 15% to 30%
  3. Total porosity: 36% to 50%
  4. Saturated conductivity: 16 to 24 inches/hour
- D. Approved Suppliers:
1. Nugent Sand Company, 1833 River Road, Louisville, KY 40206. Phone 502-645-3187.

### **PART 3 EXECUTION**

#### **3.01 Examination**

- A. Verify grading and intended elevations are as indicated on drawings and conformance survey has been completed and approved.
- B. Sports Field Contractor is to locate and mark all existing irrigation heads, valve boxes and other existing items to remain, and protect them from damage. Any damage to existing items is to be repaired immediately.

#### **3.02 Preparation**

- A. Protect site features to remain, including bench marks, survey control points, existing structures, fences, and sidewalks.
- B. Confirm that root zone material can and will be delivered in washed, clean truck beds with full bed covers.
- C. Stockpile material in a location approved by the Owner, and protected from both air and water born contamination. Stockpile area is to be paved and cleaned of all debris including sand/silt/clay. If a paved area is not available, separation fabric is to be installed between the stockpile and the ground surface.

#### **3.03 Root Zone Material Placement**

- A. All deliveries of root zone material are to be inspected for contamination. If any material appears to be contaminated or differs from the approved root zone mix, it shall either be rejected or stockpiled separately from the main stockpile, and a composite sample taken and sent to the approved testing agency for analysis. The material in question is not to be installed until the testing shows that it meets the contract requirements. Any material that does not meet the contract requirements is to be removed from the site by the Contractor.
- B. Root zone material is to be dumped and bladed into place using low ground pressure equipment. No trucks or non-low ground pressure equipment is allowed on the sand base area. Care is to be taken to prevent damage to the subdrainage system (stone, pipe and fabric) and irrigation system, and any damage done is to be remediated immediately and documented with photos and locations of damage and repair.
- C. Root zone material is to be installed in maximum five (5) inch lifts.

#### **3.04 Finish Grading**

- A. Maintain profiles and contour of design elevations for a crowned slope of 0.75 percent.
- B. Prior to finish grading, root zone material is to be thoroughly watered until saturation for initial densification of the material.
- C. After initial densification, the finished surface is to be laser graded to meet the required elevation tolerances.
- D. Upon completion of the laser grading, the root zone material is to be thoroughly watered until saturation again, and any resulting low areas are to be filled to the design elevation and planarity. This process is to be done each time additional material is added to the surface after laser grading until the surface is smooth and firm, but does not exceed the bulk density determined by laboratory testing.
- E. Any over-densification of the root zone material beyond the laboratory determined bulk density is to be remediated by scarifying the material to a minimum depth of six (6) inches and re-grading. If scarification and re-grading are required, the above laser grading and water densification process is to be repeated.

- F. Upon completion of the finish laser grading, a conformance survey of the root zone material is to be performed by the Contractor and provided to the Owner and Architect for review and approval. Elevations are to be taken on a minimum 25-foot grid.

**3.05 Tolerances**

- A. Root zone elevation: 0.25 inches from design elevation
- B. Root zone planarity: 0.25 inches over 25-foot grid

**3.06 Cleaning**

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Remove unused materials from the site.

**3.07 Protection**

- A. Protect from stormwater runoff and subsequent construction operations.
- B. Do not permit any traffic until the sports turf installation begins.

**END OF SECTION**