



a NATURAL SAND COMPANY product

## **PERFORMANCE SPECIFICATION CUSTOM ROOT ZONE SYSTEM**

### **PART 1 – GENERAL**

#### **1.1 SUMMARY**

- A. This section includes the material and labor requirements for the construction of a complete sports field root zone system with the following materials:
  - 1. USGA Spec Sand
    - See section 2.2 for confidence intervals.
  - 2. FS 90 Clay Amendment; produced by DuraEdge Products.
- B. Related Sections
  - 1. Site Preparation
  - 2. Earthwork

#### **1.2 SUBMITTALS**

- A. Product Data: For the product specified, submit a five (5) pound sample along with a private lab test result indicating the particle size analysis of the material specified. All tests shall be performed in accordance with ASTM F1632 and C136.

Approved Testing Lab: A. MCNITT & SERENSOIL TESTING  
1338 DEERFIELD DR  
STATE COLLEGE PA 16803

#### **1.3 PROJECT / SITE CONDITIONS**

- A. All site work and earthwork shall be performed in accordance with the preceding specification sections. Furthermore, the compacted sub-grade shall be installed in accordance with the final slope and shall mirror finish grade in order to ensure an even depth of material once placement has occurred.

## 1.4 QUALITY ASSURANCE

- A. **Installer Qualifications:** Installers of the sand based root zone materials specified shall have, at minimum, five successful installations of similar root zone projects and materials. References of past successful projects will be required. Installers shall be in possession of and demonstrate knowledge of the use of appropriate tools and equipment for the proper compaction and finishing of the sports field area.
- B. **Material:** If quality control samples are specified, they shall be completed at a rate of one per 250 tons of material delivered to the job site. All tests shall be conducted by the lab specified in Section 1.2 (B). All testing will be compared to and be in accordance with the material specifications provided in Section 2.2.

## PART 2 – MATERIALS

### 2.1 MANUFACTURER

- A. Fusion Custom Sport Soils is produced by the following manufacturer:

Natural Sand Company  
4783 Harlansburg Road,  
Slippery Rock, PA 16057  
Phone: (724) 530-2298  
Fax: (724) 530-6696  
Email: [info@naturalsand.com](mailto:info@naturalsand.com)

### 2.2 MATERIALS

- A. Fusion Custom Sport Soils is an engineered soil product which can be mechanically mixed offsite in a controlled environment using a pug mill-type mixer. This process ensures thorough mixing of the sand and clay components to exact specifications. In certain instances, an onsite pug mill-type mixer can be utilized as long as samples are being tested by the approved testing lab prior to installing the product.
- B. Product Specification:
  - 1. **FS 90 Clay Amendment** is an engineered clay product which is mechanically crushed and screened down to 5/32" minus. The clay amendment shall be clean, dry clay resulting in a weed-free mixture that is reddish brown in color having a yield of 1.75 tons per cubic yard and possessing the following particle size analysis:
    - a. Total sand content shall be 5-20 percent.
    - b. The combined amount of silt and clay shall be greater than 80 percent.
    - c. The overall clay content shall be greater than 30 percent.
    - d. No particles greater than 2 millimeters.
    - e. Equal to or less than 5 percent of particles shall be retained on the 2 millimeter.

Materials meeting this specification would be FS 90 Infield (Clay) Amendment as manufactured by DuraEdge Products, Inc., Grove City, PA, (866) 867-0052.

2. **Sand**

- a. Sand is broken down into fractions called Gravel, greater than 2.0 mm in diameter, Very Coarse Sand which is between 1 and 2 mm. in diameter, Coarse Sand which is between 1 and 0.5 mm., Medium Sand between 0.5 and 0.25 mm. in diameter, Fine Sand between 0.25 and 0.15 mm., and Very Fine Sand which is 0.15 to 0.05 mm. in diameter. An ideal sand would have from 1.8%-5.3% Gravel; 10%-20%; Very Coarse Sand; 22% - 31% Coarse sand; 25% - 34% Medium Sand, 9.5% - 13% Fine Sand and 1.3%-2.5% Very Fine Sand.

	<b><u>Confidence Intervals</u></b> <b><u>Based on Mix 4849-01</u></b>	<b><u>BENCHMARK</u></b> <b><u>4849-01</u></b>
(No. 10) Gravel (> 2.0 mm)	1.8 - 5.3%	3.5%
(No. 18) Very Coarse Sand (2.0 - 1.0 mm)	10.0 - 20.0%	19.0%
(No. 35) Coarse Sand (1.0 - 0.5 mm)	22.8 - 30.8%	26.8%
(No. 60) Medium Sand (0.5 - 0.25 mm)	25.2 - 34.2%	29.7%
(No. 100) Fine Sand (0.25 - 0.15 mm)	9.5 - 12.9%	11.2%
(No. 270) Very Fine Sand (0.15 - 0.05 mm)	1.3 - 2.5%	1.9%
Silt + Clay (< 0.05 mm)	5.9 - 9.9%	7.9%
Total Fines		9.8%
Percolation Rate		26.5
Total Porosity		36.2%
Air-Filled Porosity		20.3%
Capillary Porosity		15.9%

2.3 **EXCESS MATERIALS**

- A. Supply, in addition to the required amount of root zone, 100 tons of root zone material for the Owner to use for post-sprig maintenance. Have it delivered and stored at a designated location within the facility after completion of job, but prior to the final payment.

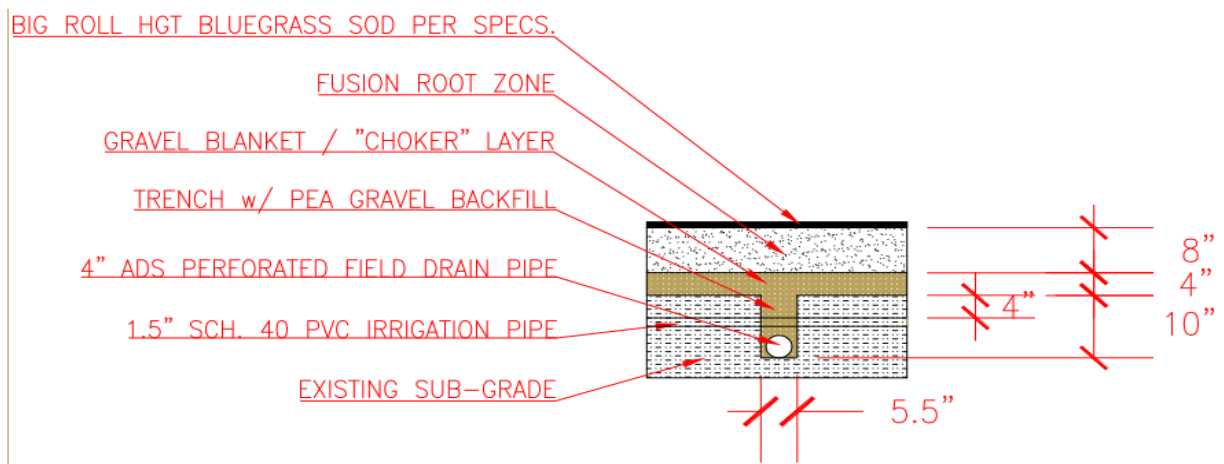
**PART 3 – EXECUTION**

3.1 **PLACEMENT**

- A. In all instances, a grade check survey of the sub-grade elevations shall occur prior to placement of the Fusion Root Zone mix. After the sub-grade elevations mirror the final grade elevations minus 8", provide "preliminary" grade stakes at 20'-0" o.c. to allow for the proper distribution of the Fusion Root Zone Mix. The compaction rate will be monitored with

the grade stakes before and after a thorough watering to achieve the 8" of Fusion Root Zone mix per the contract documents.

- B. The thoroughly mixed Fusion root zone mix material shall be placed on the playing field and firmed to a uniform depth of 8" with a tolerance of +/- 0.25". Be sure that the mix is moist when spreading to discourage migration into the gravel and to assist in firming.
- C. Throughout the installation of the root zone system, the sub-contractor shall maintain sufficient moisture throughout the root zone profile. Site specific and climatic factors will need to be taken into account by the sub-contractor to ensure the proper installation to a uniform depth of 8" with a tolerance of +/-0.25".
- D. Fusion Custom Sport Soils mix is to be used as the root zone mix. The initial infiltration rate shall be between a 15" - 25" per hour.
- E. Depth of the material shall vary when finished and compacted. Please see diagram in 3.1.F.
- F. Typical cross-section of Fusion Root Zone:



### 3.2 SUBSURFACE DRAINAGE

- A. The Sports Field sub-surface drainage system shall be designed by a licensed engineer in combination with the coordination of the Fusion Sports Zone Mix. The degradation of the infiltration rates of the Sports Zone Mix shall be taken into consideration over a 5 year period, to allow for proper long term drainage of the Sports Field system. Lateral lines shall be spaced not more than 12'-0" apart and extended to the perimeter of the field. Drainage design considerations should be given to the disposal of drainage waters away from the play areas and to the laws regulating drainage water disposal.

### 3.3 WATERING

- A. If upon initial installation, the Fusion Root Zone Mix is unable to achieve optimum compaction, the application of water will need to be monitored and recorded until the optimum moisture content is achieved. (i.e. dry weather conditions at the time of application).

### **3.4 SURFACE DRAINAGE**

- A. To maintain adequate surface drainage, all field installations should include a minimum of a 1% slope gradient to remove the surface water away from the playing field in case of a storm event with severe rainfall. Refer to the Sports Field sub-drainage plan for the location of surface drainage inlets, perforated drainage tile locations and main line drainage piping for the removal of surface water down to the subsurface drainage collection system.

### **3.5 INSPECTION**

- A. The finished surface of the sports field shall be smooth and free from any visible dips, humps, bumps or other blemishes which would hinder the removal of water through positive surface drainage. In all instances, a finished elevation survey shall be conducted to assure proper installation.

**END OF SECTION**