

Airfield Systems

Grading and Compaction Sub-base Preparation Guide

PART 1 GENERAL

1.01 SUMMARY

This section describes the requirements for materials, labor and equipment needed for the installation of a finished sub-base for the installation of the AirField Sub-Surface Drainage System.

1.02 RELATED SECTIONS

- A. AirField Systems Illustrated Manual for Artificial Turf
 - B. AirField Sub-Surface Drainage System for Artificial Turf
- OR
- C. AirField Sub-Surface Drainage System for Natural Turf

1.03 PROJECT CONDITIONS

Refer to project drawings for existing topographical survey and site conditions. A Licensed Geo-Technical Engineer shall conduct soil borings and soil test reports for the proposed site. Refer to the provided Licensed Geo-Technical Report for existing soil conditions and Licensed Geo-Technical Engineer's Recommendations for proper sub-grade preparation. Any identified expansive soils in the proposed field area shall be over-excavated and replaced with compacted suitable soils or modified on site by lime or fly ash stabilization as recommended by the Licensed Geo-Technical Engineer.

1.04 QUALITY CONTROL

- A. Inspection: Notify the Owners Representative at least 48 hours before inspection of sub-base and/or sub-grade is to take place.
- B. Quality Control Plan and Submittals:
 - 1. Samples shall be submitted as specified herein in the form that will appear on site.
 - 2. Submit certified test reports of the sieve analysis to enable the Owner's Representative to determine compliance with the specifications for all materials in this section.

3. Verification of specified compaction density is required prior to installation of the AirDrain Sub-Surface Drainage System. Provide density testing results of the field sub-grade, a minimum of one test for every 4000 SF.
4. Schedule of the earthwork and grading activities, at least 5 days prior to importing any fill materials to the site.
5. Equipment to be utilized on the site.
6. Control of surface water and removal from site.
7. Protection procedures for excavated stockpiled fill.
8. Methods for drying of site soils.

PART 2 PRODUCTS

- 2.01 FILL: Provide borrow soil materials when sufficient satisfactory soil materials are not available on site.

SUBBASE MATERIAL (FILL or BACKFILL): Fill shall consist of soil and/or crusher fines with no sharp edges and/or rounded crushed concrete with no sharp edges with material passing No. 200 sieve not to exceed 5% of material passing 3/8" square sieve which is free of organic material and is non plastic. No rocks over 3/8" will be tolerated. Stockpile any select on-site material deemed usable for structural fill material as approved by the Licensed Geo-Technical Engineer. Rocks over 3/8" in diameter, sticks, debris, vegetation, deleterious substances or sharp penetrating objects such as decomposed granite that will puncture fabric or membrane liners shall be rejected and removed prior to sub-base completion. The material shall not contain more than 3 percent organic material by weight. Install fill in compacted lifts not to exceed 4" in depth over the existing sub-grade. Refer to the Licensed Geo-Technical Engineer recommendations for final depth of layer and material used.

PART 3 EXECUTION

3.01 FIELD SURVEY AND LAYOUT

- A. The Contractor shall lay out all work and control points required to construct all work as indicated in the drawings and specifications. Maintain grade stakes until sub-base and/or finished grades are approved by the Licensed Geo-Technical Engineer and Owner's Representative.

3.02 SCHEDULE & PROTECTION

- A. Submit a field installation schedule for review by Owner's Representative.
- B. Provide and maintain slopes, crowns and ditches in excavation to insure satisfactory surface drainage at all times. Provide temporary drainage facilities to prevent water from draining into excavations. When work is completed, restore temporary ditches or cuts to original grade or finished grades as indicated.
- C. Keep excavations free from water at all times. Take measures and furnish equipment and labor necessary to control water flow, drainage and accumulation of water as required to permit completion of work under this section to avoid damage to work. Discharge water into storm drainage system and or sub-drainage piping system as approved by the Owner's Representative.
- D. All newly disturbed site soils shall be seal rolled at the end of each day to minimize moisture penetrating into sub-base.
- E. The completed sub-base is to be inspected, accepted and signed off by the Licensed Geo-Technical Engineer, Owner's Representative and Playing Field Contractor. Sub-base is to be verified as in compliance with grading elevations, soil moisture content and soil compaction requirements before any work above sub-base is allowed to proceed. Document compliance produced by the Licensed Geo-Technical Engineer with survey information and test results forwarded to Owner's Representative and Playing Field Contractor. Once sub-base has been accepted, proceed with sub-surface drainage system immediately. Completed sub-base is not to be left exposed to moisture and elements. At all times, the completed sub-base must be at acceptable moisture content when the associated sub-surface drainage system is installed atop.

3.03 COMPACTION

- A. Compaction shall be to the minimum densities, reference ASTM D 698:
 - 1. Utility trench backfill 95%
 - 2. Sub-base 95%
 - 3. Fill under asphalt paving and sidewalks 95%

3.04 EXCAVATION

- A. Place structured fill material in compacted lifts not to exceed 4" in depth. The fill shall be placed while within 3 percent of optimum moisture content. Each lift should be spread evenly and be thoroughly compacted to a uniform density equal to a least 95% of the maximum laboratory dry density as described in ASTM D1557 prior to placement of subsequent lifts. Fills shall be placed as soon as possible to allow for natural settlement.

- B. If debris, soft spots or loose or excessively moist areas are found at the bottom of the excavation, immediately report condition to Owner's Representative. If unsuitable bearing materials are encountered at the required sub-grade elevations, over excavate and replace the excavated material with imported fill from an off site stockpile to a depth determined by the Licensed Geo-Technical Engineer. Excavated materials shall be removed to an off site location at the expense of the Excavation Contractor. Newly formed excavations shall not exceed 2:1 slope. Do not proceed with sub-base work until identified unsatisfactory conditions have been corrected in an acceptable manner.
- C. Excavation work shall be scheduled for dry weather conditions and shall be kept free from water. Excavated areas must be free of water, ice, snow and frozen surfaces. If wet weather is encountered or the site becomes flooded, earthwork will proceed in small sections to minimize exposure of soils. Unsuitable soils shall be removed and immediately replaced with suitable clean fill. Stockpiles of suitable site and delivered off-site soils shall be protected by plastic sheeting and anchored to the ground. Wet weather methods as noted above will take place at no additional cost to the Owner.
- D. The excavated areas for the field surface must be sloped to drain and sealed with a heavy roller to prevent non compacted soils from absorbing water and ponding of water. Do not backfill over existing excavated sub-grade surfaces that are wet or pumping material with a high silt and clay volumes. Optimum moisture content of all backfill materials shall be maintained to obtain required compaction.
- E. All excavation, installation of backfill materials and compaction of on site and off site materials shall be tested and certified by a certified testing laboratory and the project Licensed Geo-Technical Engineer shall determine compliance with specifications. Installation of materials above the sub-base will not proceed until the Owner, the Licensed Geo-Technical Engineer and the Field Installation Contractor have approved the completed sub-base.
- F. Excavation for pipe trenches shall be along a straight line unless otherwise indicated. The width of the trench shall be a minimum of 1' plus the width of the pipe. The side of the pipe trench shall be vertical. Excavated trenches will have a smooth bottom free of rocks over 1" diameter. Any over excavations are to receive compacted structural fill as directed at Contractor's expense.
- G. Shoring and Sheeting: Sides of excavation basin to comply with all codes and ordinances having jurisdiction. Shore and brace sidewalls as needed for stability of materials excavated with members of sizes and arrangement sufficient to prevent injury to persons, damage to structures, caving and erosion. Maintain shoring and bracing until excavations are backfilled.

3.05 FINISH GRADING

- A. Cut and fill all areas to elevations and tolerances as shown on plans and specifications. Leave graded surfaces clean, free of debris, rocks, sticks, etc. and rolled smooth to achieve a true uniform surface relative to final surface grade. Ensure that any sharp objects on the sub-base are removed to prevent penetration or future wear on fabric or membrane layers.
- B. Standing water on sub-base will not be tolerated. Provide temporary ditches as needed so that no areas of the site will have ponding water during rainfall. Pump all low areas that cannot be drained by gravity.
- C. Finished sub-base under playing field shall be established to within the elevations of the project drawings. Grades of .5% to 1% to a tolerance of (+/-) 0.02' as verified by a 25' x 25' grid survey certification are required before sub-base is turned over to the Field Contractor for field completion. The Contractor will not be allowed to install the sub-surface drainage system until the sub-base has been inspected, approved and signed off by the Owner's Representative, Licensed Geo-Technical Engineer and Playing Field Contractor.

END OF SECTION

DISCLAIMER: The following drawings and/or general installation instructions are provided only to show a concept design for installation and are not instructions for any particular installation. These drawings and general instructions are not complete and are provided only to assist a Licensed Geo-Technical Engineer, a Landscape Architect and/or Civil Engineer in preparing actual construction and installation plans. These drawings and instructions must be reviewed by a Licensed Geo-Technical Engineer, a Landscape Architect and/or Civil Engineer and adapted to the condition of a particular installation site and to comply with all state and local requirements for each installation site. THESE DRAWINGS AND/OR GENERAL INSTRUCTIONS DO NOT MODIFY OR SUPPLEMENT ANY EXPRESS OR IMPLIED WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IF APPLICABLE RELATING TO THE PRODUCT.