1. Proposed field area sub-grade is to be certified by a Licensed Geo-Technical Engineer as in compliance with all project specifications before work commencement on the AirField Sub-Surface Drainage System. Any discrepancies noted upon preliminary sub-grade inspection are to be satisfactorily repaired according to related specification sections and repairs verified before proceeding with work. Any sub-grade deficiencies will transfer through to the finished playing surface.

2. Field Engineer and Licensed Geo-Technical Engineer shall determine if project conditions require the addition of a sub-base drainage course atop the established sub-grade elevation. Established sub-grade elevation shall be predetermined by the Field Engineer to allow, or not allow, for depth of sub-base drainage course. Refer to “Airfield Grading and Compaction of an Athletic Field Sub-base” specification section should additional sub-base drainage course be required by specific project conditions. If no additional sub-base drainage course is deemed necessary, then the established sub-grade will serve as the field sub-base and be so referenced.

3. Once sub-base and/or sub-grade have been inspected and accepted by a Licensed Geo-Technical Engineer, the AirField Sub-Surface Drainage System installation begins with the construction of perimeter trench drains. Trenches are to be neatly excavated with free standing sidewalls and free of loose debris in excavation bottom. Trench excavation to be as dimensioned by Field Engineer and as shown on project plans. Trench excavation to be laser graded to plan elevations. See Figure 1 for typical trench excavation illustration.

4. The Geo-Technical Engineer should specify the appropriate thickness and type of liners and filter fabrics for the trenches and the field cavity. Before the installation of any liners and/or filter fabrics a Licensed Geo-Technical Engineer should be consulted about adding additional filter fabrics atop and/or beneath any impervious liners installed in the trenches or on the field cavity.

5. Begin installation of liner for drainage system immediately upon acceptance of sub-base and completion of trench excavation. Accepted moisture content and grading of sub-surface is critical to maintain until coverage by liner can be accomplished. Ensure that any sharp objects that could compromise the liner barrier are removed before installation of liner. Liner installation to begin at selected field corner with liner edge glued to field wood nailer/concrete curb section installed by others (see Figure 2).
6. Install liner into the trench excavations. Liner material should lie smoothly against trench excavation sidewalls and bottom and be extended a minimum of two feet past each excavation edge (see Figure 3).

7. Place a minimum of 2 inches of specified and approved bedding material into the bottom of trench excavation. Take care to monitor all bedding material for compliance with specifications. Material to be free of sharp edges which could damage liner material (see Figure 4).

8. Locate each run of trench drainpipe material and place to plan elevations. Perform laser grade verification of the installed pipe elevations for compliance with plans. All pipe joint couplings are to cover one full corrugation on each annular section of pipe (see Figure 5).

9. Backfill pipe sides and top with approved bedding material. Again, ensure liner is not damaged by back filling operation. Interior of pipe sections to remain free of dirt, debris and other deleterious material during back fill operations. Protect pipe ends as needed. Bring trench backfill material level to previously accepted sub-base. Trench backfill material to be plate compacted to specified densities (see Figure 6).

10. Visually inspect sub-base and remove any stones, clods or sharp objects. Verify sub-base compliance with moisture content, compaction, and grading elevations and begin balance of liner installation immediately upon sub-base compliance verification. Liner to be laid directly atop approved sub-base. Overlap liner panels a minimum of 8 inches. Seams are to be glue adhered or heat welded dependent upon Licensed Geo-Technical Engineer’s recommendation (see Figure 7). It is of primary importance to orient liner seams in a shingle like pattern with the upslope piece overlying the down-slope piece to prevent water from working under the lap (see Figure 8). For typical completed field liner layout and cross section refer to Figures 9 & 10.

Temporarily ballast loose liner edges as needed during installation. Overlap liner panels a minimum of 8 inches as shown in Figures 11 & 12. Protect completed liner until drainage system completion. Do not allow vehicular traffic to come into direct contact with installed liner material. After installation, the liner shall be completely impermeable to water penetration and shall meet the approval of the Field Engineer.

*NOTE – If sub-base and/or sub-grade materials have been so approved by the project Licensed Geo-Technical Engineer and the Licensed Geo-Technical Engineer determines that a liner is not necessary then the liner of the sub-surface drainage system may be replaced with a geo-textile fabric as specified.
11. Confirm compaction of trench drain backfill material and recompact and regrade as necessary. Install a 10 foot width of geo-textile fabric material over length of trench drains to prevent backfill material migration into AirDrain GeoCell material (see Figure 13).

12. Begin installation of the AirDrain GeoCell material over the Licensed Geo-Technical Engineers approved liner (see Figure 14). The AirDrain GeoCell panels are to be installed with the larger diameter clover openings facing upwards. Place the first GeoCell panel to the field’s upper left hand corner. It is of primary importance to orient the GeoCell materials with the integral indicator tab to the panel’s bottom left hand corner (refer to Figures 15 and 16). Proper sequencing and orientation of panels will result in a rapid installation.

The GeoCell panels are to be installed across the field in a rowed pattern. Staggering of rows will allow for multiple row completion by a multi-manned crew. Secure the first panel (1-1) to the field wood nailer/concrete curb and commence with panels 1-2, 1-3 and so on with one directional pull to secure (see Figures 17 and Y). After each one directional pull secures the panel connectors together, slightly push back each panel to allow for contraction space at each connector. Verify each integral connector is snapped in place with sufficient contraction room allowed as panel installation proceeds.

Once the first row has progressed across the field, start with the second row. By maintaining proper GeoCell panel orientation, the top edge panel connectors will drop into the previously installed panel receptors after the one directional pull secures the panel (see Figures 18 and Z). The GeoCell panels can be shaped to individual field areas as needed with an appropriate cutting device.

13. Install geo-textile filter fabric layer over the Airdrain GeoCell material. Firmly attach one end of the geo-textile filter fabric roll to the field wood nailer/curb by nailing or staple gun. Roll the geo-textile filter fabric across the entire width of the field until it reaches the wood nailer/curb on the opposite side of the field. Firmly attach the geo-textile filter fabric to the wood nailer/curb on this side of the field. (See Figures 19 and 20).

Apply 2 to 4 inches of approved adhesive with a paint roller to the top surface of the fabric edge. Firmly attach the next geo-textile filter fabric roll to the field wood nailer/curb. Overlap the first piece of filter fabric by approximately 6 inches to cover the 2 to 4 inches of approved adhesive and roll out the next filter fabric section across the field (see Figure 21). When the opposite side of the field is reached, firmly attach the filter fabric to the field wood nailer/curb. Repeat this process until all the AirDrain GeoCell is completely covered with geo-textile filter fabric. Once the geo-textile filter fabric installation is complete there should be no visible gaps, puckering, folds, wrinkles or excessive loose material overhangs.
Installed geo-textile filter fabric is to be smoothly laid across all the AirDrain GeoCell material.

14. Once the geo-textile fabric has been installed atop the AirDrain GeoCell material, the Sub-Surface Drainage System is complete and ready for inspection and acceptance by the Playing Field Contractor. Any readily visible deficiencies in the Sub-Surface Drainage System will be apparent in the finished playing field surface. Satisfactorily repair all deficiencies noted and obtain approval and acceptance before proceeding with artificial turf system installation. Minimize any required vehicular traffic on completed sub-surface drainage system. **Where vehicular traffic is required use only vehicles with flotation type tires.**
Minimize vehicle speed, do not brake or accelerate suddenly, do not make any sharp turns and minimize turning on drainage system to the greatest extent possible. Any sub-surface drainage system damaged by field installation is to be satisfactorily repaired and accepted before the artificial turf is installed. Refer to Figure 21 for completed playing field cross 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.**
TYPICAL AIRFIELD CROSS SECTION OF A PVC LINER INSTALLATION

Fig. 10
TYPICAL AIRFIELD® GEOCELL PANEL
INSTALLATION SEQUENCING

Fig. 15
AIRDRAIN® GEOCELL PANEL

Fig. 16
Fig. 22