ATS
Artificial Turf, Base, and Drainage

QUALIFICATIONS

The Synthetic Turf System Installer and Manufacturer shall be required to comply with the following:

1. Manufacturer of the Synthetic Turf System shall be a firm specializing and experienced in manufacturing products specified within this section.

2. The complete installation of the Synthetic Turf System, as described in the scope of these specifications, shall be carried out by factory certified technicians with the experience and proven ability to complete the project.

3. The Grading, Base and Drainage Contractor or qualified subcontractor must be equipped and experienced in import/export aggregate and fill materials, installation of subsurface drainage systems and of Laser fine grading.

SUBMITTALS

The Turf Installer/Manufacturer shall be required to submit the following:

1. A list of five (5) completed projects and references of the Synthetic Turf System Installation of similar size and scope within the past 5 years.

2. One boxed Synthetic Turf System, with proper infill, representing the exact system and materials, which will be installed in this project.

3. The Synthetic Turf System Manufacturer shall supply a turf layout where rolls of synthetic turf shall be laid perpendicular to the sidelines of the field and arranged in strips running the entire width of the playing field. Head seams are not acceptable. 3. Upon completion of the Synthetic Turf System owner will receive a CARE KIT. This CARE KIT spells out care and maintenance instructions.

4. A factory certification document for the supervising technician executing the ‘lay and sew’ portion of the Scope of Work.

5. The turf contractor shall provide the necessary testing data to the owner that the finished field meets or exceeds the required shock attenuation property (G-Max) of less than 135 G’s and will not exceed that level throughout the warranty period. The Grading, Base and Drainage Contractor shall be required to submit the following: A list of three (3) completed projects and references involving grading and drainage of similar size and scope within the past 5 years.

WARRANTY

The Turf Installer/Manufacturer shall submit a Warranty that guarantees the usability and playability of the Synthetic Turf System for its intended use throughout the eight (8) year warranty period. Options for warranty insurance policy and ten (10) year extended warranty must be made available to owner.

SCOPE OF WORK

It shall be the responsibility of the Grading Base and Drainage Contractor to provide all labor, materials, equipment and tools necessary for the complete installation of a rubber granule filled synthetic turf system. The work shall include the following items:

1. Grade, contour, slope and compact sub-base.

2. Install a geotextile non-woven membrane over the compacted sub-base.

3. Install “Multi Flow” subsurface drainage system from Varicore Technologies, Prinsburg, MN (or equal) to plan and manufacturer specifications. Connect subsurface drainage system to existing perimeter drain system.

4. Install a porous, free-draining stone aggregate base of three-quarter inch (3/4”) stone to a minimum depth of four inches (4”) per plan.

5. Install a concrete six-inch by twelve-inch (6” x 12”) anchor curb.

6. Install a two-inch (2”) layer of fine stone screenings one-eighth inch (1/8”– 1/4”).

It shall be the responsibility of Synthetic Turf System Installer to provide all labor, materials, equipment and tools necessary for the complete installation of a rubber granule filled synthetic turf system. The work shall include the following items:

1. Install Synthetic Turf System with fibers approximately two inches (2”) high.

2. Install a 100%, post-consumer cyogranulated rubber infill to manufacturer recommendation. Granulated rubber material is to be clean and free of metal or other contaminants.

3. Install all inlaid or painted lines markings and artwork as specified by the owner.

BASE AND DRAINAGE CONSTRUCTION

1. The sub-base will have a slope of 0.5%.

2. The base aggregate shall consist of a minimum of four inches (4”), free-draining stone, depending on site location. Finish slope of porous aggregate should be 0.05% from the centerline of the field to the sidelines, and the grade should not vary more than a half an inch (1/2”) in ten feet (10’). The sieve analysis of the open grade stone shall show a gradation as follows:

% of Passing	**Sieve Size**
100	1.25”
70-100	3/4”
30-50	3/8”
8-40	#4
0-12	#16
0-5	#200

The Stone shall be installed maintaining a finished grade slope of 0.5%. The owner and Synthetic Turf System Manufacturer must approve variations of this finished slope. The depth of the aggregate will increase at the edges of the field, as determined by the sub-base slope, as the elevations are maintained throughout. The washed stone aggregate material must be free draining, consistent with the vertical draining requirements of the Synthetic Turf System Manufacturer and owner.

3. The finished grade of the aggregate base shall not vary more than a quarter of an inch (1/4") in ten feet (10'). A laser grader is to be employed.

4. Cut and fill of sub-base soils should be conducted as necessary to establish proper grade of sub-base to a tolerance of one-half inch (1/2") in ten feet (10'). Sub-base shall be sloped of 0.5% from center of field toward sidelines.

5. The sub-base compacted using a ten (10) ton vibrating roller, to approximately 95% Proctor density.

6. Vendor will supply and install a porous non-woven polypropylene stabilization fabric (Amoco 4545 or equal) over the entire surface before the installation of the stone depending on geographic location.

7. Install a one inch by six inch (1" x 6") prefabricated Multi-Flow (or equal) under drain system in a "V" deign as shown on drawing with lines approximately twenty feet (20') on center and connect to a perimeter linear drain.

8. The Contractor shall supply water proof tape and all necessary connectors, per subsurface drainage system manufacturer's recommendation, and is responsible for a proper and secure connection between all new and existing drainage lines.

9. Install up to a two-inch (2") layer of one eighth to a quarter of an inch (1/8" – 1/4") porous stone over the base, maintaining slope and grade, depending on the geographic location. Finish grade to tolerance of a quarter of an inch (1/4") in ten feet (10') and compact with four to six ton (4 - 6) motorized roller to approximately 90% Proctor. The sieve analysis of the fine grade stone shall show a gradation as follows:

% of Passing	**Sieve Size**
100	1/4"
60-100	1/8"
5-10	#100
0-5	#200

10. The Synthetic Turf System Manufacturer and architect will accept the aggregate base in writing prior to the installation of the Synthetic Turf System.

SYNTHETIC TURF SYSTEM INSTALLATION

1. The carpet rolls are to be installed directly over the aggregate base. Care should be taken to avoid disturbing the planarity and compaction of the prepared base.

2. Turf shall be arranged in strips per approved turf layout. Adjacent strips of turf are to be sewn together per manufacturer's recommendation. Adhesives are not to be used at longitudinal seams. All seams shall be flat, taught and permanent and shall be undetectable in appearance, feel and performance.

3. The in fill installation shall be started immediately following the completion of the turf installation. The infill material shall be spread evenly with a large fertilizer type spreader (minimum four feet (4') wide). Between applications, the in filled area shall be brushed with a motorized rotary nylon broom. Minimum infill depth shall be one and three-quarter inches (1 3/4").

4. The Synthetic Turf System is anchored to the curb supplied at the perimeter per Synthetic Turf System Manufacturer's recommendation. The Synthetic Turf System must be carefully trimmed, secured and in filled around goal posts, sleeves, other projections and turf penetrations.

5. Field markings shall be installed per plan as specified.

SYNTHETIC TURF SPECIFICATION AND MATERIALS

1. **Fiber:** The pile fiber shall be 100% Thiolene polyethylene, 100 microns thick. No other fiber will be accepted. The fiber shall be non-abrasive polyethylene measuring a minimum of two inches (2"). The fiber shall be a proven athletic caliber yarn designed specifically for outdoor use and treated with UV inhibitor and stabilizers to resist the effects of ultraviolet degradation, heat, foot traffic, water and airborne pollutants. The fiber shall contain no toxic substances or heavy metals. The fiber shall be agitated with a motorized rotary nylon broom prior to installation, rolling or spiraling will not be accepted. The fiber shall meet or exceed the following requirements:
   (a) Linear Density (Denier): 8,500
   (b) Breaking Load: 30 psi
   (c) Elongation to Break: >16%

   The Fiber should be further specified as follows:
   (a) Fiber/Pile Weight: 41 ounces per square yard
   (b) Fiber Thickness: 100 microns
   (c) Pile Height: 2 inches
   (d) Color Fastness: Min. ref. Standard 8 Blue Scales (BS1006)
   (e) UV Stability: UV absorbers of Hindered Amine Type
   (f) Fiber Tuft Spacing: three eighths of an inch (3/8") in straight stitch

2. **Primary Backing:** The primary backing shall be a heat and UV resistant three layer, woven product. The primary backing shall be and shall provide dimensional stability in all directions to prevent stretching, and distortion upon installation. The components and performance shall meet or exceed the following requirements:
   (a) Weight: at least 8-oz/sq. yard
   (b) 5% elongation (warp): 410 minimum
   (c) Force @ 5% elongation (weft): 615 minimum

(d) Grab Tear Strength (X-Y): 400-250 lb
(e) Backing (roll) width: 15 Feet
(f) Dimensional Stability: 47.10 N/sq meter (warp), 49.10 N/sq meter (weft)

3. **Secondary Backing:** The secondary backing shall saturate the primary backing and effectively lock the fiber tufts in place to the primary backing. The components and performance shall meet or exceed the following requirements: material: Polyurethane coating weight: 30 oz/sq. yd drainage perforations: 3/16" diameter at four inches (4") or less on-center on both axes tuft bind strength (w/out infill): >15 lbs grab tear X and Y (turf assembly): >400 lbs X direction and >250 lbs Y direction

4. **Infill Material:** Infill system shall be 100% rubber. The rubber must be free of all toxics and metals. The mesh size of the granulated rubber must be 14/30. The all-rubber infill must be clean material and will be tested for compliance. Any other rubber will not be accepted. No sand will be permitted in the infill material. Depth of material at completion of placement shall be at least 1.75" (+/- 0.125") and as required to reach the required initial and term G-max ratings.

MAINTENANCE EQUIPMENT

The Turf Contractor shall provide the Client as a part of the contract, non-powered sweeper/groomer with standard hitch to connect to Client's tractor vehicles. The sweeper/groomer shall be of sufficient size to cover at least a four-foot (4') wide swath (and no more than six feet (6')) in a single pass. The sweeper/groomer shall operate utilizing rotating synthetic bristle brushes fixed to an adjustable height broom attachment.