

SECTION 02925 - SYNTHETIC TURF

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Furnishing all labor, materials, tools and equipment necessary to install, in place, all synthetic turf and infill materials as indicated on the plans and as specified herein. The installation of all new materials shall be performed in strict accordance with the manufacturers written installation instructions, and in accordance with all approved shop drawings.

1.3 SUBMITTALS

- A. Items B, E, F K I and J with the bid if different than specified brand. .
- B. Product Data: For each type of product indicated.
- C. Shop Drawings: Show fabrication and installation details for synthetic turf.
- D. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.
- E. Samples for Verification: For the following products, in manufacturer's standard sizes.
 - 1. A 12-inch x 12-inch, minimum sample of the exact synthetic turf and infill system that is specified for this project, if different than specified..
 - 2. Sand / Rubber mix with proper mix ratio, if different than specified..
- F. Manufacturer Certificates: Certified list of twenty-five (25) existing installations of the synthetic turf infill system that is specified for this project within the last three years, including Owner representative and telephone number, attesting compliance with quality assurance information. These fields must comply with the materials section of the specification. All must be located in the continental United States.
- G. Qualification Data: The turf manufacturer must have 25 football specific installations of 65,000 square feet or more of this specific type infill system that have been in use for a minimum of five years all being located in the Continental United States in locations similar in climate to the Northeast USA. These fields shall not have been constructed over an E-Layer (elastic) or a formed under pad.

- H. Turf system must have at least five (5) FIFA recommended / approved installations. These installations must be constructed utilizing the same infill components and methods of installation described within this section. These installations must be located in the United States.
- I. Sample Warranty: Must be provided with bid submittal. Provide a sample pre paid third party insured warranty with the bid. Policy must e in force at time of bid.
- J. Warranties: The Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a period of eight (8) years from the date of substantial completion. The turf manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured, pre paid for the entire 8 year term and be non-prorated. The Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. Prior to final payment for the synthetic turf, the Contractor shall submit to owner an insurance policy, guaranteeing the warranty to the Owner. The insurance must reflect the following values: 1) no maximum per claim coverage amount.. 2) minimum of ten- million dollar annual aggregate 3) Must cover full 100% replacement value of total square footage installed , minimum of \$7.00 per sq ft. 4) Pre Paid 8 year third party policy must be issued by a carrier with an A.M. Best rated "A+" or better rating. 5) Policies that include self insurance or self retention clauses shall not be considered. Policy can not include any form of deductible amount. Policy must be in force at time of bid.
- K. Synthetic turf system shall be approved as ADA Handicap accessible as determined by Test Method - ASTM 1951-99 (Standard Specification for determination of accessibility of surface under and around playground equipment). Proof of passing test report must be submitted with the bid.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative of synthetic turf manufacturer for installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain synthetic turf through one source from a single manufacturer.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
- D. All components and their installation method shall be designed and manufactured for use on outdoor athletic fields. The materials as hereinafter specified, should be able to withstand full climatic exposure in the Northeast USA, be resistant to insect infestation, rot, fungus and mildew; to ultra-violet light and heat degradation, and shall have the basic characteristic of flow through-drainage allowing free movement of surface run-off through turf and directly into the prepared granular base and into the field drainage system.

- E. The synthetic turf and components shall be of national reputation with previous use at all levels of competition, including professional and collegiate levels of Football and Soccer and shall have been in use for a period of not less than three years. The turf fabric shall be produced by the manufacturer and installed by factory-authorized distributors directly employing the installation crew. Manufacturing "jobbers" or installation "subcontractors" shall not be permitted.
- F. The turf manufacturer must be experienced in the manufacture and installation of this specific type of synthetic infilled grass system (comply w/ materials section of this specification) with completed installations in the United States, for at least six (6) years, and have completed at least twenty five (25) installations of this specific type (must comply with description of system under materials section of this specification) within the last three (3) years within the Continental United States.
- G. The turf manufacturer must have 25 football specific installations of 65,000 sf or more of this specific type infill system that have been in use for a minimum of five years all being located in the Continental United States in locations similar in climate to the Northeast USA. These fields shall not have been constructed over an E-Layer or a formed under pad.
- H. Turf system must have at least five (5) FIFA recommended / approved installations. These installations must be constructed utilizing the same infill components and methods of installation described within this section. These installations must be located in the United States.
- I. Prior to the bid and/or Landscape Architect approval of a specified synthetic turf system, the company and manufacturer (if different than company) shall specify in writing that their turf system does not violate any other manufacturers patents, patents allowed or patents pending.
- J. Prior to the beginning of installation, the manufacturer/ installer of the synthetic turf shall inspect the sub base and supply a Certificate of Subbase Acceptance for the purpose of obtaining manufacturer's warranty for the finished synthetic playing surface.

1.5 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit synthetic turf to be performed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Indicate measurements on Shop Drawings.

1.6 WARRANTY

- A. Special Warranty: Turf must maintain an ASTM F 355 G Max of less than 190 for the life of the warranty.
- B. Warranty Period: Eight (8) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Fieldturf

. Fieldturf, Inc., (800) 724-2969 or (732) 677-0484.

2.2 MATERIALS

A. Synthetic Grass System: A complete synthetic grass system consisting of minimum 2 inches long) polyethylene-blended fiber or an upgrade to a true monofilament extruded spined fiber, tufted to a double primary porous backing and a porous secondary backing. (flat tape monofilament fiber shall not be acceptable) The fiber shall be a minimum of 8,000 denier, low friction fiber, measuring minimum 2 inches high. The low friction fiber shall be specifically designed to virtually eliminate abrasion.

1. The tufted fiber weight shall not be less than 30 ounces per square yard. The low friction fiber shall be custom blended polyethylene or a true monofilament extruded spined fiber, treated with UV inhibitors. The tufted rows of fiber are to be spaced ¾” apart.
2. The carpet's primary backing shall be a layered polypropylene fabric treated with W inhibitors. The secondary backing shall consist of an application of porous, heat-activated material to permanently lock the fiber tufts in place. **PERFORATED-BACKED CARPET SHALL NOT BE ACCEPTABLE.**
3. The carpet shall be delivered in 15 feet wide rolls. The rolls shall be of sufficient length to go from sideline to sideline. Head seams, other than at sidelines, will not be acceptable. Cord for sewing seams of turf shall be as recommended by the synthetic turf manufacturer. Perimeter edge details required for the system shall be as detailed and recommended by the manufacturer, and as approved by the manufacturer.

B. Resilient Layered Infill: A resilient layered infill system consisting of specifically formulated rounded silica sand and cryogenically processed rubber. The infill installation consists of a base layer of sand followed by a homogenous mixture of the sand and the cryogenically processed rubber. A final application of specifically sized cryogenically processed rubber completes the system. **SYSTEMS WITHOUT CRYOGENICALLY PROCESSED RUBBER OR A FINISH APPLICATION OF STRAIGHT RUBBER CRYOGENICALLY PROCESSED WILL NOT BE ACCEPTABLE.** The sand infill component must represent the majority percentage of the total infill (50% minimum). The total infill amount shall be no less than 7.5 lbs. Per sq.ft.

C. Base Stone:

%PASSING

<u>Sieves</u>	<u>Base Stone Type 1</u>	<u>Base Stone Type 2</u>	<u>Finishing Stone</u>
3” or 75mm			
2” or 50mm	100		

1½" or 38mm	90-100		
1" or 25mm	75-100	100	
¾ or 19mm	65-95	90-100	
½" or 12.5mm	55-85	80-100	100
3/8" or 9.5mm	40-75	70-100	85-100
¼" or 6.3mm	25-65	60-90	75-100
US #4 or 4.75mm	15-60	50-85	60-90
US #8 or 2.36mm	0-40	30-65	35-75
US #16 or 1.18mm	0-20	10-50	10-55
US #30 or 600mm	0-10	0-35	0-40
US #60 or 250mm	0-8	0-15	0-15
US #100 or 150mm	0-6	0-8	0-8
US #200 or 75mm	0-5	0-2	0-2

RESTRICTIONS:

1. To ensure structural stability: $D_{60}/D_{10} > 5$ and $1 < \frac{D_{30}^2}{D_{10} D_{60}} < 3$
Fragmentation must be 100%.
2. To ensure separation of both stones: $\frac{D_{85} \text{ of finishing stone}}{D_{15} \text{ of base stone}} > 2$
and $3 < \frac{D_{50} \text{ of base stone}}{D_{50} \text{ of finishing stone}} < 6$
3. To ensure proper drainage: Permeability of base stone > 50 in/hr (3.5×10^{-2} cm/sec)
Permeability of finishing stone > 10 in/hr (7.0×10^{-3} cm/sec)
Porosity of both stones $> 25\%$ (When stone is saturated and compacted to 95% Proctor.)

D. Perimeter Edge: 6 inch by 6 inch recycled plastic timber, un-notched.

E. Underdrain System

1. ADS AdvanEdge
 - a. 1 inch by 12 inch flat drain.
 - b. ADS AdvanEdge end connector with 4 inch ADS pipe.
 - c. 6 inch diameter perforated collector drain pipe.
 - d. 6 inch diameter solid wall HDPE cleanout with 8 inch by 8 inch by 8 gauge aluminum plate with synthetic surface glued directly to plate.
2. Approved equivalent.

F. Turf Groomer: The Contractor shall provide a turf grooming system, which consists of spiked wheels designed to penetrate the infill in order to loosen the infill without damaging the grass

fibers and light raking tines attached to the rear of the unit designed to groom the exposed grass fibers to keep them from matting down excessively. This equipment shall be approved by the turf manufacturer and the Owner to be used by the Owner as directed by the Manufacturer. No additional payment will be made for providing the equipment, but the costs for providing the equipment shall be included in the price bid for synthetic turf.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. The surface to receive the synthetic turf shall be inspected and certified by the manufacturer as ready for the installation of the synthetic turf system and must be perfectly clean as installation commences and shall be maintained in that condition throughout the process. The final subbase surface shall be surveyed by the contractor by means of a laser level with a minimum 500 shots taken (10-foot grid). Based on the contractor's topological survey, the contractor shall fine grade the subbase suitably - including properly rolling and compacting the base. The contractor shall survey the areas that were fine graded and shall submit the final topological survey to the turf installer and the Landscape Architect for approval. **CONTRACTOR SHALL NOT APPROVE THE SUBBASE FOR TOLERANCE TO GRADE WITHOUT OBTAINING THE TOPOLOGICAL SURVEY.**
- D. The installation shall be performed in full compliance with approved shop drawings. Only factory-trained technicians skilled in the installation of athletic caliber synthetic turf systems, working under the direct supervision of the manufacturer's supervisors, shall undertake the placement of the system. The designated Supervisory personnel on the project must be certified, in writing by the turf manufacturer, as competent in the installation of this material, including sewing seams and proper installation of the infill mixture. The manufacturer shall certify the installation and warranty compliance. The surface to receive the synthetic turf shall be inspected and certified by the manufacturer as ready for the installation of the synthetic turf system and must be perfectly clean as installation commences and shall be maintained in that condition throughout the process.

3.2 PREPARATION

- A. Preparation of Subgrade: All topsoil, organic, and non-compactable materials need to be removed.

- B. The soil bed must have a minimum slope of 0.5% or more, depending on the soil analysis, from the longitudinal center of the field towards the sidelines.
- C. The soil bed must be compacted in both directions to attain the specified compaction rate of 95% standard Proctor.
- D. The soil bed must be prepared to tolerances of not more than 1/2" from design grade to allow for even drainage.
- E. A geotextile fabric is required to cover the soil bed.

3.3 INSTALLATION

- A. Underdrain System: Install as detailed on the drawings and as recommended by the manufacturer of the synthetic turf system.
- B. Perimeter Edge: Install at entire perimeter of synthetic turf system where synthetic turf abuts natural lawn areas. Set on minimum 3" layer of stone dust or screenings. Spike with #4 re-bar, hammered into soil, spaced as recommended by the manufacturer. Synthetic carpet system will overlap on top, and be tacked or nailed to perimeter edge side.
- C. Base Stone
 - 1. The base stone must be laid without damaging the soil bed, geotextile liner or drains. It is very important to not create any depressions with heavy equipment. The specified stone or aggregate supplied must conform to the recommended specifications. The finished crushed stone or aggregate base supplied must be stable and permeable.
 - 2. If the required compacted depth of the base course exceeds 6", the base shall be constructed in 2 or more layers or lifts of approximate equal thickness. Each layer must be compacted in both directions to attain the specified compaction rate.
 - 3. The base course must be sloped 0.5% from the center longitudinal axis towards the sidelines or as specified.
 - 4. The grade of the base course shall not vary from the specified grade by more than 1/2" from design grade.
 - 5. The base course must be compacted in both directions to attain the specified compaction rate of 95% standard Proctor.
- D. Finishing Stone
 - 1. The final grade aggregate layer should not be more than 2" deep.
 - 2. The final grade material must be sloped 0.5% from the center longitudinal axis towards the side lines unless otherwise specified.
 - 3. The final grade must be compacted in both directions to attain the specified compaction rate of 95% standard Proctor.
 - 4. The final grade of the finishing stone shall not vary from the specified grade by more than 1/2" from design grade, nor by more than 1/4" in 10ft. Laser guided grading is highly recommended.

E. Synthetic Turf

1. The carpet rolls are to be installed directly over the properly prepared base stone. Extreme care should be taken to avoid disturbing the base stone, both in regard to compaction and planarity. A 2-5 ton static roller shall be on site and available to repair and properly compact any disturbed areas of the base stone.
2. The full width rolls shall be laid out across the field. Utilizing standard state of the art sewing procedures, each roll shall be attached to the next. Each seam will be double sewn. When all of the rolls of the playing surface have been installed, the sideline areas shall be installed at right angles to the playing field turf. **GLUING OF ROLLS SHALL NOT BE ACCEPTABLE.** This is a 99% sewn installation. Minimum gluing will only be permitted to repair problem areas, and corner completions.
3. Turf panel seams shall be sewn. All turf panel seams shall be sewn with high strength thread. All seams shall be transverse to the field direction; i.e., run perpendicularly across the field. Seams shall be flat, tight, and permanent with no separation or fraying.
4. Synthetic turf shall be installed across the field and attached to the perimeter edge detail. Turf shall be of sufficient length to permit full cross-field installation. No head or cross seams will be allowed.

F. Resilient Layered Infill

1. The blending infill material shall be spread evenly with a large spreader, (minimum 5-foot wide). Between applications the infill area shall be brushed with a motorized rotary nylon broom. Infill depth shall be such that a maximum of $\frac{3}{4}$ inch of fiber is exposed.
2. The infill system shall be the only acceptable cushioning system. E-layers and formed rubber pads shall be deemed unacceptable as enhancements to meet the necessary safety requirements.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Services: Testing and inspecting of completed applications of synthetic turf system shall take place in successive stages, in areas of extent and using methods as follows. Do not proceed with application of the next stage until test results for previously completed applications show compliance with requirements.
- C. Remove and replace applications where test results indicate that it does not comply with specified requirements.

3.5 FINAL ACCEPTANCE

- A. Prior to Final Acceptance, the Contractor shall submit to the owner three (3) copies of Maintenance Manuals, which will include all necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including painting and striping.
- B. The Contractor shall provide evidence that the turf can be plowed with conventional rubber bladed snow removal equipment.

- C. The finished playing surface shall appear as mowed grass with no irregularities and shall afford excellent traction for conventional athletic shoes of all types. The finished surface shall resist abrasion and cutting from normal use.

3.6 CLEANING

- A. Contractor shall provide the labor, supplies and equipment as necessary for final cleaning of surfaces and installed items. All usable remnants of new material shall become the property of the Owner. The Contractor shall keep the area clean throughout the project and clear of debris. Surfaces, recesses, enclosures, etc., shall be cleaned, as necessary, to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

END OF SECTION 02925