SECTION 32100
INFILLED SYNTHETIC TURF SYSTEM

PART I – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. The work under this section shall consist of furnishing all labor, materials, and equipment necessary to install, in place, all synthetic turf and other materials as indicated on the plans and as specified herein. The installation of all new materials shall be performed in strict accordance with these specifications, the turf provider's instructions and in accordance with all details and shop drawings.

1.3 SUBMITTALS

A. Substitutions: ***Rootzone 3D3 Blend 52*** has been identified as the 'base' product. Other products are acceptable if in compliance with all requirements of these specifications. Submit alternate products with the bid proposal and provide the following:
    1. Provide all specifications, product data, certification and required information for proposed alternate. It is the responsibility of the bidder to prove that the product specified is equivalent to or greater than the product specified.
    2. Provide a sample copy of insured warranty and insurance policy information
    3. Provide a sample (8.5" x 11") of the product

B. Product Data: For each type of product indicated.
    1. Submit catalog cuts, material safety data sheets (MSDS), brochures, specifications, preparation and installation instructions and recommendations.
    2. All supplied and installed materials and products will meet or exceed the minimum specifications designated in this section. Sufficient data must be submitted to indicate compliance with the Contract Documents.
    3. Submit instructions for installation.

C. Test Results: The following test results, certified by a licensed independent testing laboratory, shall be submitted as outlined below
    1. With the bid – Mandatory and minimum specifications as shown in Part 2. Bids not meeting the minimum specifications will be rejected.
    2. Upon completion of the installation of the infill (including anti-static applications)— Installer must measure and record infill depth using a depth tester with analog or digital readout. At ten separate field locations, three data points should be recorded by measuring the infill depth in a triangular pattern approximately 12” – 18” apart. At each of the ten testing locations, the three data points should be averaged. Any location that does not measure 1.2” in depth or more must be corrected.
    3. At completion of project – Dynamic Cushioning Test according to ASTM F-355-95, Procedure A and Standard F-1936-98.
D. Shop Drawings: Show fabrication and installation details for synthetic turf including, but not limited to:
    1. Proposed locations of all seams in fabric surfacing. Show installation methods and construction.
    2. Field lining and marking - Submit a complete scale and dimensional drawing of inlaid or tufted-in field lines and marking boundaries. Include graphics for end zones and center logo artwork for approval as well.
    3. All submittals shall be provided within 14 days after Notice to Proceed
E. The Turf Manufacturer shall provide the following samples of the artificial turf selected for this project
    1. An 8.5” x 11” minimum sample of the exact synthetic turf and infill system that is specified for this project.
    2. Infill mix in accordance with product specifications
F. Turf Manufacturer Certificates: Certified list of fifty (50) existing installations of a synthetic turf and infill system within the last three years, including Owner Representative and telephone number, attesting compliance with quality assurance information. All must be located within the continental United States.
G. With the bid - Proof that the Turf Manufacturer is a member, in good standing, of the Synthetic Turf Council
H. With the bid – Sample Warranty: Provide a sample pre-paid third party insured warranty with the bid. Policy must be in force at the time of the bid.
    1. The Contractor shall provide a warranty to the Owner that covers defects in materials and installation workmanship of the turf for a

period of eight (8) years from the date of substantial completion. The turf provider must verify that their representative has inspected the installation and that the work conforms to the turf provider's requirements and any written directives. The warranty shall include general wear and damage caused from UV degradation. Other items that must be addressed include the following:

a. Acceptable uses for the field
b. Fading
c. Color match within specifications
d. Excessive fiber wear
e. Wrinkling and panel movement
f. Shock absorbency (Gmax)
g. Seam integrity
h. Drainage (through the turf only)

2. Exclusions shall include the following:
    a. Vandalism
    b. Acts of God
3. The warranty shall be fully third-party insured for the entire 8-Year term and be non-prorated. Warranties that include language which pro-rates benefits shall cause the provider's bid to be rejected. Prior to final payment for the synthetic turf, the Contractor shall submit to the Owner, this policy guaranteeing the warranty to the Owner. Insurance must reflect the following values:
    a. $5,000,000 per each insured warranty
    b. $5,000,000 annual aggregate for all warranties issued during each 12-month period of the 8-Year warranty
    c. Policies that are backed by a Letter of Credit are not acceptable
    d. Policy must be issued by an A- rated or greater A.M. Best Rating
    e. 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 the time of the bid.

I. With the bid – Turf Manufacturer must attest that their submitted products infringe on no known patents.
J. Maintenance and Operations Data: At the completion and acceptance of the project submit 3 complete sets, in manual and electronic form, of all the turf provider's recommended procedures and materials for, but not limited to general maintenance, line/marking installation, small repair procedures, cleaning, etc.

K. Project Record Documents: Record actual locations of seams, drains, and other pertinent information in accordance with the General Requirements (as-built surveys shall be provided – see project plans and specifications).

1.4 QUALITY ASSURANCE

A. Turf Manufacturer Qualifications
   1. Shall be experienced in the installation of synthetic infill grass for a minimum of five (5) years.
   2. Shall have a minimum of 500 full sized tall fiber infilled type field installations using the specified system. Field size to be a minimum of 65,000 square feet to qualify.
   3. Shall provide a list, with the bid, of all the installations in Florida for the past five (5) years. This list is to be provided with the bid.
   4. Shall provide third party certification confirming compliance with referenced standards.
   5. Turf Manufacture must formulate and produce its own fiber master batch.

B. Installer Qualifications:
   1. Installation team shall be an established, insured installation firm experienced as a premium turf installer with suitable equipment and supervisory personnel, with a minimum of five years' experience with 15-foot-wide tufted materials.
   2. Installation team shall be trained and certified, in writing, by the turf manufacturer, as competent in the installation of the specified material, including seaming and proper installation of the infill mixture.
   3. Site superintendent shall have at least 10 installations that are similar to this type of tall fiber synthetic turf system.

C. 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, 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 the turf and directly into prepared granular base and into the field drainage system. The turf fabric shall be installed by factory-authorized and certified technicians.

1.5 PROJECT CONDITIONS

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

1.6 WARRANTY – Special warranty for American Football: Turf must maintain an ASTM F 355 Gmax of less than 165 for the life of the warranty. This is for the entire warranty period of eight (8) years.

1.7 MAINTENANCE SERVICE – Turf Installation Contractor shall train maintenance staff and/or contracted maintenance staff in the use of the recommended maintenance equipment and provide maintenance guidelines to the facility maintenance staff.

PART TWO – PRODUCTS

2.1 ACCEPTABLE TURF MANUFACTURERS

A. Pre-Approved turf manufacturer:
    1. AstroTurf Corporation – AstroTurf® Rootzone 3D3 Blend 52
       2680 Abutment Road, SE
       Dalton, GA 30721
    2. Alternate provider is acceptable and must be equivalent to, or exceed, all listed requirements, qualifications, and specifications.

2.2 TURF MATERIALS

A. Synthetic Turf System: A complete synthetic turf system consisting of a combination of 10,800 denier monofilament fibers made from a singularly extruded combination of stabilized polyethylene and nylon polymers with proper compatibilizers and 10,000 denier parallel slit film fibers along with an in-house factory extruded monofilament. Pile height shall be nominal 2.0". Fibers shall be tufted to a primary backing and a mechanically applied adhesive secondary backing.
    1. The tufted fiber's face weight shall not weigh less than 50 ounces per square yard. The tufted rows of fiber are to be spaced no more than 3/8" apart. ASTM tests proving the fiber meets these qualifications must be provided with the bid. Turf systems that do not meet this specification will be disqualified.
    2. The carpet's primary backing shall have a minimum weight of 6.7 oz per square yard. The carpet shall then be coated with a secondary backing of polyurethane synthetic coating material with a minimum application rate of 20 ounces per square yard and then perforated for adequate drainage. Carpets that are not perforated for adequate drainage shall not be acceptable.
    3. The carpet shall be delivered in 15' 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.
B. The infilled pile surface shall provide good traction in all types of weather with the use of conventional sneaker type shoes, composition molded sole athletic shoes, and screw- in style football cleats.
C. The pile surface shall be suitable for both temporary and permanent line markings using acrylic paint, as per the turf provider's recommendations.
D. All adhesives used in bonding the seams shall be resistant to moisture, freeze/thaw, bacteria and fungus attacks, and resistant to ultraviolet radiation. The adhesive shall be made especially for the adhesion of synthetic turf seams and inlaid field markings and graphics.
E. The seam specific adhesive system shall have been utilized on at least 25 full installations. Provide this information with the bid. It shall consist of a factory-made adhesive bed applied to a non-woven fabric seaming tape. The adhesive bed shall be a metered amount suitable for the application. It shall be heat and pressure activated. A special heat application machine and pressure application using weighted rollers is mandatory.
F. Supply field groomer and sweeper or single maintenance apparatus that performs both basic maintenance functions.

G. Perimeter edge details required for the system shall be as detailed and recommended by the turf provider, and as approved by the turf provider.

2.3 TURF FABRIC SURFACE

A. The pile surface shall resemble freshly mown natural grass in appearance, texture and color.
B. The pile surface shall be nominally uniform in length.
C. The pile fiber angle shall be 90 degrees ± 15 degrees, measured from the horizontal after installation of the infill material.
D. The entire system shall be resistant to weather, insects, rot, mildew and fungus growth and will be non-allergic and non-toxic.
E. The synthetic turf system shall have a nominal fiber length of 2.0”.
F. Each roll shall be minimum 15’ wide
G. The entire system shall be constructed for porous standards as specified. Synthetic turf system shall be perforated at 4 – 6” on center. Systems that are not perforated for maximum drainage shall not be acceptable.
H. All markings shall be tufted in-place, inlaid or glued. It is recommended that the maximum amount of markings be factory-prefabricated into the turf system prior to shipment to site. At a minimum all football and soccer markings (with the exception of hash marks) shall be factory prefabricated.

2.4 PRODUCT SPECIFICATIONS – TURF

A. Face yarns shall be a proven athletic quality, outdoor stabilized monofilament made from a singularly extruded combination of stabilized polyethylene and nylon polymers with proper compatibilizers.
B. The fabric shall possess the following minimum physical characteristics. ASTM testing shall be provided with the bid and any products not meeting the minimum physical characteristics will be rejected:

Average Pile Yarn Face Weight	ASTM D 5848	50 oz/square yard
Average Total Weight	ASTM D 5848	78.7 oz/square yard
Secondary Backing Weight	ASTM D 5848	20 oz/square yard
Primary Backing	ASTM D 5848	6.7 oz/square yard
Minimum Tuft Length	ASTM D 5823	2.0”
Tufting Gauge	ASTM D 5793	3/8” maximum
Tuft Bind	ASTM D 1335	> 8 lbs
Yarn Denier (monofilament fiber)	ASTM D 1577	10,800/6
Yarn Denier (slit film fiber)	ASTM D 1577	10,000/1
Yarn Denier (root area fiber)	ASTM D 1577	5,600/8

Fiber Thickness (Mono/slit-film)	ASTM D 3218	330/115 microns
Surface Flammability	ASTM D 2859	TEST PASSED
Permeability	ASTM F 1551	>30 in/hr, minimum
Melt Point	ASTM D 789	248 deg Fahrenheit
Gmax System	ASTM F 355	<125 at installation <165 over life of warranty

2.5 Infill Material

A. Infill composition shall consist of a ballast layer of silica sand topped by ambient SBR (styrene-butadiene rubber) performance infill in a ratio by weight of 65% rubber / 35% sand.
B. Silica sand infill:
    1. Must be clean, sub-angular silica sand
    2. Must be a 20-40 sieve size.
C. SBR infill:
    1. Must be ambient SBR Rubber
    2. Must be a 10-20 sieve size.
D. Immediately after infill layers are installed, infill depth must be measured per testing protocol detailed in Section 1.3 C. 2 above to ensure that infill layer is at least 1.2” deep.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of the synthetic turf, examine substrates and conditions, with Installer present, for compliance with requirements for visual installation tolerances. Proceed with installation only after unsatisfactory conditions have been corrected.
B. Certification of prior work: The synthetic turf manufacturer and/or certified installation contractor shall perform a visual inspection of the field base onto which the synthetic turf system is to be installed and to examine the finished surface for required compaction, and grade tolerances (through string line testing). After any discrepancies between the required materials, application and tolerance requirements noted have been corrected, the synthetic turf installer should submit a written certification of VISUAL acceptance of the base for installation of the synthetic turf system. Prior to installing the synthetic turf, the installation contractor shall have the acceptance, in writing, of the Owner’s representative (engineer of record, geotechnical engineer, etc.).
C. Installation of all materials shall be performed in full compliance with approved project shop drawings. Only factory trained and certified

technicians skilled in the installation of athletic caliber synthetic turf systems, shall undertake the placement of the turf system. The designated supervisory personnel on the project must be certified, in writing by the turf provider as competent in the installation of these materials, including proper seaming and proper installation of the infill mixture. The turf provider shall certify the installation and warranty compliance.

3.2 PREPARATION

A. Inspect delivered field surface fabric and components immediately prior to installation. Any damaged or defective items shall be rejected. Installed synthetic turf system shall be inspected for, but not limited to, the following:
    1. Uniformity of product and color
    2. Surface wrinkles
    3. Field markings
    4. Field Edge installation
    5. Pile height of each roll shall be measured. Any material(s) that does not meet minimum height and thickness specifications shall be rejected. Pile height shall be measured in its finished positions.

B. Environmental Conditions: Weather conditions are important for the successful installation of the systems. No work under this section will proceed when:
    1. Ambient temperatures are below 45 degrees F.
    2. Material temperatures are below 45 degrees F.
    3. Surfaces are wet or damp
    4. Rain is imminent or falling.
    5. Conditions exist or are imminent, which will be unsuitable to installation requirements of the systems specified herein. Humidity levels will be inside the limits recommended by the adhesive manufacturer to obtain optimal bonding characteristics of the surfaces.

3.3 INSTALLATION OF THE SYNTHETIC TURF

A. The full width rolls shall be laid out across the field. When all of the rolls of the playing surface have been installed, the sideline areas will be installed at right angles to the playing field turf. All seam widths are to be held to a minimum and shall be traverse to the field direction. Seams shall be flat, tight, and permanent with no separation or fraying. All seams shall remain as required for the duration of the warranty period.

B. The perimeter of the field shall be firmly secured to the edge anchors for the life of the warranty and in accordance to project details.
C. Resilient Infill
    1. The sand ballast infill material shall be spot inspected and tested for conformance to sieve specifications.
    2. Sand ballast Infill must be placed in such a way as to minimize fiber entrapment.
    3. The rubber infill must be uniformly applied so as to ensure uniform, predictable surface.
    4. After infill layers are installed, infill depth must be measured to ensure that infill depth is at least 1.2” deep.

3.4 Field Lining and Markings

A. All markings shall be installed in accordance with prior approved project Shop Drawings.
B. Inlays shall conform to the turf manufacturer’s specifications, directions, and recommendations for the best results.
C. Striping layouts shall be accurately measured by the Contractor before installation of inlaid field markings
D. Install inlays only when the surface is completely dry. Adhere all inlays securely into place. Never loose-lay and sew an inlay into place.

3.5 FIELD QUALITY CONTROL—Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
A. Testing Services: Testing and inspecting of completed applications of synthetic turf system shall take place in suggestive states, in areas of extent and using methods that are industry standard. Do not proceed with application of next stages until test results for previously completed applications show compliance.
B. Remove and replace items where test results indicate that it does not comply with specified requirements.

3.6 FINAL ACCEPTANCE

A. Upon final acceptance, the Manufacturer 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. The Manufacturer shall provide an electronic copy of the manual.

B. The Manufacturer shall ensure that the turf can be plowed with Manufacturer approved snow removal equipment as detailed in the provided Maintenance Manuals.
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.

3.7 CLEANING

A. To the satisfaction of the Owner, 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.
B. To the satisfaction of the Owner, Contractor shall provide the labor, supplies and equipment as necessary for final cleaning of the underground drainage system. All debris, sediments, materials, etc. shall be removed from all inlets, pipes, etc. that are incorporated into the system.

END OF SECTION