

SECTION 32 1813 - SYNTHETIC TURF

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORKS INCLUDED

- A. Turf Supplier/Installer shall be responsible for all work pertaining to the synthetic turf: A synthetic turf system consisting of fibers, tufted into a backing of woven and non-woven fabrics with a secondary backing as standard with the manufacturer. The synthetic turf system shall be provided with an infill system consisting of manufacturer's standard rubber granules and in combination with coated sand product. The synthetic turf system and all its components shall be compliant with the necessary requirements and specifications of the international governing bodies to ensure the certification of works. Refer to attached drawings delineating the scope of work of the Turf Supplier/Installer.
- B. Turf Supplier/Installer shall furnish all labor, materials, tools and equipment necessary to install all synthetic turf as indicated on the plans and as specified herein and other related specifications. The installation of all new materials shall be performed in strict accordance with the manufacturer's installation instructions and in accordance with all approved shop drawings.
- C. Turf Supplier/Installer shall adhere to all applicable laws and provisions during the duration of their works.
- D. Turf Supplier/Installer shall abide by all the necessary requirements and specifications of the international governing bodies to ensure the certification of the works.
- E. Turf Supplier/Installer shall secure the certification of the synthetic turf to achieve FIFA Quality Programme for Football Turf with FIFA Quality mark for the next three years after substantial completion of the works.
- F. Turf Supplier/Installer shall apply the Horizontal Drainage System for the football field suitable to the site and weather conditions of UP Mindanao, Davao City and ensure that all necessary Testing, Standards and Reports are complied with.
- G. Turf Supplier/Installer shall provide maintenance of the completed synthetic turf for the next three (3) years after its completion at the Contactor's own cost.
- H. Turf Supplier/Installer shall install line markings compliant with FIFA standards.
- I. Turf Supplier/Installer shall provide and install one pair of FIFA standard goal post and one extra pair of portable FIFA standard goal post complete with standard net and other necessary paraphernalia.

CONSTRUCTION OF UP MINDANAO SPORTS COMPLEX FACILITIES
(Completion of Football Field: Supplies and Installation of Synthetic Turf System)

- J. Turf Supplier/Installer shall render close coordination and supervision works of the Base Constructor's works upon issuance of the Notice of Award and shall conduct regular site visits to be monitored by the Owner's representative(s).
- K. Turf Supplier/Installer shall provide a written five (5) year warranty supported by a third party insured warranty policy from an "A" Rated Domestic insurance carrier.
- L. Turf Supplier/Installer shall conduct a minimum of one site visit of the Base Constructor's works and submit the "Affidavit of Site Inspection" duly signed and notarized during the Bidding Process.
- M. Turf Supplier/Installer shall conduct the testing of the system to comply with specified and all relevant requirements. Turf Supplier/Installer shall submit all written results and reports to the Owner.
- N. Turf Supplier/Installer shall abide by the Environmental Corporate Responsibility as further stipulated in part 3.10 of this document.

1.3 REFERENCE STANDARDS

- A. FM Factory Manual
 - 1. P7825 - Approval Guide; Factory Mutual Research Corporation; current edition
- B. ASTM Standard Test Methods:
 - 1. D1577 - Standard Test Method for Linear Density of Textile Fiber
 - 2. D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering
 - 3. D418 - Standard Test Method for Testing Pile Yarn Floor Covering Construction
 - 4. D1338 - Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings
 - 5. D1682 - Standard Method of Test for Breaking Load and Elongation of Textile Fabrics
 - 6. D5034 - Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test)
 - 7. F1015 - Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces
 - 8. D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity
 - 9. D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
 - 10. F355 - Standard Test Method for Shock-Absorbing Properties of Playing Surfaces.
 - 11. F1936 - Standard Test Method for Shock-Absorbing Properties of North American Football Field Playing Systems as Measured in the Field
 - 12. D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - 13. F2765 - Standard Test Method for Total Lead Content in Synthetic Turf Fibers E1613 Test Method 3032 EPA Method
 - 14. ASTM F1551 - Water Permeability of Synthetic Turf Systems and Permeable Bases
- C. FIFA (Fédération Internationale de Football Association) - Laws of the Game 2016/2017

D. FIFA Football Stadiums - Technical Recommendations and Requirements

E. FIFA Quality Concept for Football Turf - Handbook of Requirements

F. [FIFA Quality Programme for Football Turf](#)

1.4 SUBMITTALS DURING BIDDING PROCESS AS PART OF THE TECHNICAL DOCUMENTS

A. Synthetic Turf Supplier/Installer is to submit the following documents during the bidding process:

1. [List of their completed and ongoing projects within the last five \(5\) years with details provided \(i.e. Project name and location, name of owner/client, scope of work, synthetic turf product name, construction cost, year started and completed, duration of construction\). Supplier/Installer must have completed at least one \(1\) similar local project for the supply and installation of synthetic turf in the last five \(5\) years.](#)
2. Product Data:
 - a. Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations; storage, handling requirements and recommendations.
 - b. Submit fiber manufacturer's name, type of fiber and composition of fiber.
 - c. Submit data in sufficient detail to indicate compliance with the contract documents.
 - d. Submit manufacturer's instructions for installation.
 - e. [Submit list of complete product components and the brand and origin of each component to be provided.](#)
 - f. Submit manufacturer's instructions for maintenance for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.
3. Samples:
 - a. Submit two samples: one 12x12 inch (minimum) boxed including infill representing finished turf system, including pad if applicable (see construction drawings) and one 12x12 inch (minimum) loose and without infill. Loose sample should demonstrate seaming and include an inlaid line.
 - b. Submit a sample of sand infill and a sample of rubber infill and a sample of the final sand/ rubber mixture, including ratio by volume and its weight equivalent per square foot and method of installation. Sample of each shall represent the exact quantity per square foot. Rubber and sand particle size gradation charts must also be included.
4. Prior to the issuance of the Notice of Award, submit a Statement agreeing that Supplier/Installer will submit a written "Certification of Acceptance of the Base Construction" to ensure that the base preparation works are completed as per the Turf Manufacturer's specification and conditions.
5. Submit presentation materials (preferably MS PowerPoint format on USB flash drive) that the Bidder will use during their oral presentation not longer than 30 minutes to highlight the design, material, method of construction, and schedule of

CONSTRUCTION OF UP MINDANAO SPORTS COMPLEX FACILITIES
(Completion of Football Field: Supplies and Installation of Synthetic Turf System)

works, among others, compliant with the requirements of this specification, if needed.

6. Warranty: Submit a proposed warranty package.
7. Submit duly signed and notarized official letter from the respective FIFA Preferred Producer stating that the Bidder's company is their authorized supplier/installer.
8. Supplier/Installer must be supported by the Technical Supervisor from their FIFA Preferred Producer throughout the duration of their installation works. Submit CV or resume of the Technical Supervisor during the post-qualification stage.
9. Submit detailed Master Schedule of the works with overall duration of six (6) months. Master Schedule shall start from Issuance of Notice to Proceed to Substantial Completion.

1.5 SUBMITTALS DURING CONSTRUCTION PHASE

- A. Turf Installer are to submit the following documents during the construction phase for Owner's approval:
 1. Shop Drawings: Layout, colors, widths, and dimensions of game lines. Allow Owner to review at least 2 weeks prior to application.
 - a. Field layout
 - b. Field Marking Plan and details for the specified sports: soccer.
 - c. Roll/Seaming Marking Plan
 - d. Show installation methods and construction indicating field verified conditions, clearances, measurements, terminations, drainage including any details of construction that deviate from the plans and specs.
 - e. Striping plan; layouts showing any field lines, markings colors and boundaries, field logos, lettering for end zones. All layout striping to comply with FIFA rules and regulations.
- B. Product Certification:
 1. Submit manufacturer's certification that products and materials comply with requirements of the specifications.
 2. Submit test results indicating compliance with Reference Standards.
 3. Submit Certificate of Importation and copy of Bill of Lading from the point of origin to the delivery point (UP Mindanao Campus) or any approved equivalent document for each product component of the system.
- C. Project Record Documents: Record actual locations of seams, drains and other pertinent information.
- D. Warranties: Submit warranty and ensure that forms have been completed in Owner's name and registered with approved Supplier/Installer.
- E. Testing Certification: Submit certified copies of independent (third-party) laboratory

- reports on ASTM testing:
1. Pile Height, Face Weight & Total Fabric Weight, ASTM D5848.
 2. Primary & Secondary Backing Weights, ASTM D5848.
 3. Tuft Bind, ASTM D1335.
 4. Grab Tear Strength, ASTM D1682 or D5034.
 5. Shock Attenuation, ASTM F1936
 6. Water Permeability, ASTM D4491
 7. Lead Content, ASTM F2765
- F. Prior to Final Acceptance, the Supplier/Installer shall submit to the Owner:
1. Three (3) copies of Maintenance Manuals, which will include all necessary instructions for the proper care and preventive maintenance of the turf system, including painting and markings.
 2. Project Record Documents: Record actual locations of seams, drains or other pertinent information.
 3. Warranty: Submit Warranty and ensure that forms have been completed in Owner's name and registered with Supplier/Installer and Insurance Carrier. Submit information confirming that Third Party Insurance Policy, non-cancelable and pre-paid, is in effect covering this installation, and underwritten by an A Rated Insurance Carrier. Insurance carrier must confirm that the policy is in force and premiums paid.
- G. Submit a copy of all relevant test results indicating compliance with Reference Standards.
- H. Prior to the issuance of the Notice to Proceed, the Turf Supplier/Installer is to submit a written "Certification of Acceptance of the Base Construction" to ensure that the base preparation works are completed as per the Turf Manufacturer's specification and conditions.

1.6 QUALITY ASSURANCE

- A. Synthetic Turf Supplier/Installer shall meet the following criteria:
1. Must have completed at least one (1) similar local project for the supply and installation of synthetic turf in the last five (5) years.
 2. Must provide Synthetic Turf with FIFA Preferred Producer Certification.
 3. Must be an authorized installer of the FIFA Preferred Producer. The FIFA Preferred Producer shall have a minimum of five (5) years of experience on the supply and installation of synthetic turf for football fields.
 4. Have not had a Surety or Bonding Company finish work on any contract within the last five (5) years.
 5. Have not been disqualified or barred from performing work for any public Owner or other contracting entity.

6. Not be currently involved with any patent or trade mark litigation, specifically being sued for patent infringement.
 7. Must provide competent workmen skilled in this specific type of synthetic grass installation. Technicians must have installed this type of system, with sewn seams and monofilament fiber, on at least 1 installation in the past five (5) years.
 8. 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.
 9. The Manufacturer shall have a representative visit the site to certify, in writing, the installation and Warranty compliance.
- B. Conduct Pre-Installation Conference at Project site to review requirements for substrates and for preparation by other trades.
 - C. Prior to the beginning of installation, the installer of the synthetic turf shall inspect the sub-base. The installer will accept the sub-base in writing when the base constructor provides test results for compaction, planarity and permeability that are in compliance with the synthetic turf manufacturer's recommendations.
 - D. The Turf Supplier/Installer shall provide the necessary testing data to the owner that the finished field meets the required initial shock attenuation, as per ASTM F1936.
 - E. Turf system shall have been independently tested to drain 6"-7" per hour through system and out laterally.
 - F. Testing shall be performed in the presence of the Architect and Owner's representatives prior to final completion.
 - G. The Owner reserves the right to reject and/ or refuse acceptance of any or all aspects of the synthetic turf installation if it fails to meet the requirements of this specification section.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver product and all components in prescribed transport condition.
- B. Store materials/ products in a safe and secure place, under cover and elevated above grade.
- C. Prevent contact with materials that may cause dysfunction.
- D. Deliver and store components with labels intact and legible.
- E. Protect from damage during delivery, storage, handling and installation. Protect from damage by other trades.
- F. Inspect all delivered materials and products to ensure they are undamaged and in good condition.

G. Comply with manufacturer's recommendations.

1.8 WARRANTY AND GUARANTEE

A. The Supplier/Installer shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a minimum period of five (5) years from the date of substantial completion. Warranty shall include removal, repair/replacement defective materials as required to repair/replace synthetic turf surfacing to its original condition at no cost to the Owner. 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 nature beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured; pre-paid for the entire five (5) year term and be non-prorated. The Turf Supplier/Installer 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 Supplier/Installer shall submit to owner notification in writing that the field is officially added to the annual policy coverage, guaranteeing the warranty to the Owner. The insurance policy must be underwritten by an "A" rated carrier and must reflect the following values:

1. Minimum pre-paid five (5) year insured warranty.
2. Insured Warranty Coverage must be provided in the form of 1 single policy.
3. No maximum per claim coverage amount.
4. Must cover full 100% replacement value of total square footage installed. The warranty shall include all necessary materials, labor, transportation costs, dumping fees, etc. to complete any repairs under such warranty.
5. Policies that include self-insurance or self-retention clauses shall not be considered.
6. Policy cannot include any form of deductible amount.
7. Sample policy must be provided at time of bid to prove that policy is in force. A letter from an agent or a sample Certificate of Insurance will not be acceptable.

B. The warranty coverage shall not place limits on the amount of the field's usage.

C. The synthetic turf system must maintain a G-max of less than 180 for the life of the Warranty as per ASTM F1936. The manufacturer's warranty shall include annual G-Max Testing.

1.9 MAINTENANCE SERVICE

A. Supplier/Installer shall provide complete maintenance works for the next three years upon substantial completion of the project at no cost to the Owner.

- B. Supplier/Installer shall perform regular scheduled maintenance inspection at least twice per year for five (5) years through the warranty period.
- C. Supplier/Installer shall train the Owner's facility maintenance staff in the use of the turf manufacturer's recommended maintenance equipment.
- D. Supplier/Installer must provide maintenance guidelines and a maintenance video to the facility maintenance staff.
- E. Supplier/Installer must provide the FIFA-prescribed basic maintenance equipment such as triangle brush, tractor unit, drag mat and ball roll ramp, and other accessories and materials, necessary to certify the pitch and for synthetic turf maintenance.

1.10 TESTING

- A. Turf Supplier/Installer shall be responsible to provide independent laboratory G-max testing (ASTM 355, 1936 method) at substantial completion, to verify that the shock attenuation properties of the field meet the requirements set forth in this specification.
 - 1. The field must maintain an ASTM 355 G-max of between 110-170 for the life of the Warranty. The average G-max may not exceed 140 at any time during the life of the warranty.
 - 2. In addition to testing at time of completion, the Turf Supplier/Installer shall be responsible for annual G-max testing as described above at its own cost. If at any time the G-max ranges reach unacceptable levels, it is the responsibility of the Turf Manufacturer (or its third party warranty) to bring the field back into the required ranges at no cost to the Owner.
- B. Supplier/Installer shall be responsible to provide independent laboratory Lead Content testing prior to substantial completion and final acceptance by Owner.
 - 1. Two representative samples of fiber(s) and locations on the field shall be tested by the test methods below. The total lead content measured shall be less than 300 mg/kg (ppm). Sample locations shall be chosen by the Owner.
 - a. The testing shall be conducted by an independent environmental laboratory accredited for heavy metal testing in solid and hazardous waste.
 - b. Prepare samples as outlined in EPA Method 3052 with the temperature modified from 180 +/- 5 deg C to 210 +/- 10 deg C.
 - c. Analyze prepared samples for lead using inductively coupled plasma-atomic emission spectrometry (AAS) as outlined in Test Method E 1613.
 - d. Report total lead content as mg/kg (ppm).
- C. Turf Supplier shall be responsible to provide independent drainage testing of installed field gravel base and turf carpet with infill prior to substantial completion and final acceptance by Owner. The combined tests shall prove installed synthetic turf system's drainage capability shall allow water flow through the system at a rate of not less than 10 inches per hour.
 - 1. ASTM test WK22081- Test Methods for Vertical Permeability of Synthetic Turf

Sports Field Base Stone and System by Bucket Flood Test Method. This test does not require special equipment and can be done in the field to test the vertical permeability before the synthetic turf is installed and after installation of the base is complete. This method does not require the application of a head and more accurately mimics rainwater conditions. It provides an opportunity to actually see the surface drain.

2. ASTM F1551 -Water Permeability of Synthetic Turf Systems and Permeable Bases. Test will provide permeability of synthetic turf carpet with infill.
3. Provide written report of permeability of base, and carpet with infill over base. Report shall include inches per hour rate.

1.11 FIELD ENGINEERING

A. SERVICES OF THE LICENSED SURVEYOR

The Turf Supplier/Installer shall pay for the services of a licensed Surveyor to confirm and certify the precise location and positioning for the installation of the synthetic turf and other works of similar nature required by the Contract.

The Turf Supplier/Installer shall furnish certification from a licensed Surveyor that all portions of work are located in accordance with Contract requirements and at elevations required thereby.

The Turf Supplier/Installer through its contracted Surveyor shall promptly verify and certify to lines and levels of any portion or subdivision of work at any time it may be deemed necessary by the Owner's representative. Any deviation from the Drawings shall be certified to the Owner's representative within 24 hours of discovery of same.

B. SURVEYOR REQUISITES

The Surveyor selected for the purpose of undertaking the work involved in this project shall be subject to the Owner's representative's approval. He shall not be a regular employee of the Turf Supplier/Installer, nor shall he have any interest in the Contract. He shall be employed by the Turf Supplier/Installer in laying out the work, it being intended that the Surveyor shall present an independent and disinterested verification of the project's layout.

C. CERTIFICATION BY SURVEYOR

A final certification shall be submitted upon completion of work, or upon completion of each major segment of the work, or as required by the Owner's representative, and before final certificate, and there shall be included a map, plot, note or the like necessary in the opinion of the Owner's representative to constitute a full and complete report.

1.12 DURATION OF THE WORKS

The Turf Supplier/Installer is to complete the works within **six (6) months**, starting from the issuance of the Notice to Proceed.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Supplier/Installer for synthetic turf products shall meet or exceed the requirements listed in Part 1.6 and Part 2.2.

2.2 PRODUCT SPECIFICATION

The following product specifications are within the scope of works of the Turf Supplier/Installer.

A. Synthetic Turf

| | |
|---|---|
| System | FIFA <u>QUALITY System</u> , Horizontal Drain System with Shock Absorption <u>suitable to the site and weather conditions of UP Mindanao, Davao City</u> |
| Type of Yarn | Mono Filament, UV Resistant as per Supplier recommendation |
| Pile Height | <u>45mm minimum</u> as per Supplier recommendation |
| Color | Green Synthetic Turf as per Supplier recommendation |
| Line Marking | White Synthetic Turf as per Supplier recommendation |
| Primary Backing | 100% Double Polypropylene latex backing as per Supplier recommendation |
| Infill Materials* | Suitable to product as per Supplier recommendation |
| <ul style="list-style-type: none"> • <u>Performance Infill</u> | SBR Black Rubber Size & Quantity: 0.5 to 2.5 mm on 10kg/sq.m. as per Supplier recommendation |
| <ul style="list-style-type: none"> • <u>Stabilising Infill</u> | Silica Sand Size & Quantity: 0.4 to 1.4 mm on 15kg/sq.m. Thickness as per Supplier recommendation |

- B. Sub-Layer Composition compliant with FIFA Quality requirements and suitable to the site and weather conditions of UP Mindanao, Davao City

C. Other Facilities

| | |
|--------------------|---|
| Goals | One pair of aluminum goal post for installation at the pitch with nets and other attachments. One pair of <u>portable</u> aluminum goal post for reserved goal. All goals conforming to FIFA standards. |
| Corner Flags/Posts | Four (4) pieces conforming to FIFA standards. |

D. FIFA Quality Laboratory and Field Tests

| | |
|---|--|
| FIFA Quality Lab and Performance Tests and Certification | Facilitate the all the necessary laboratory and performance tests for the football field's FIFA QUALITY certification at the supplier/installer's own cost. |
| FIFA Quality Certification | Facilitate the FIFA QUALITY certification process for the materials and the football field at the supplier/installer's own cost. |

*Note:

1. SBR Black Rubber Infill: Granules shall contain minimal dust or contaminants and shall be derived from the ambient processing form of recycled tires. Color shall be substantially black.
 - i. The clean, uniformly sized particles shall be consistent in shape and particle size distribution.
 - ii. The particles shall resist abrasion in high traffic and excessive wear applications and provide stability to synthetic turf applications.
 - iii. The particles shall be processed and sized under rigid specifications and manufacturers statistical and quality control assurance program.
 - iv. Particles shall be structurally pure and consistently uniform in size distribution for predictable performance.
 - v. Infill material shall be approved and deemed safe by the Environment Protection Agency.

2. Silica Sand Infill: Prepare in patented percentage of blended mix as standard with manufacturer, mixed with rubber infill in tested percentages to provide G max ratings required for the work.

2.3 MAINTENANCE EQUIPMENT

- A. Supplier/Installer must provide the FIFA-prescribed basic maintenance equipment such as triangle brush, tractor unit, drag mat and ball roll ramp, and other accessories and materials, necessary to certify the pitch and for synthetic turf maintenance.

PART 3 - EXECUTION

3.1 GENERAL

- A. The installation shall be performed in full compliance with approved shop drawings.
- B. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer/manufacturer supervisors, shall undertake any cutting, sewing, gluing, shearing, topdressing or brushing operations.
- C. The designated Supervisory personnel on the project must be certified, in writing by the turf Supplier/Installer, as competent in the installation of this material, including sewing seams and proper installation of the Infill mixture.
- D. The surface to receive the synthetic turf shall be verified by the Synthetic Turf Installer 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 EXAMINATION

- A. Verify that all sub-base, drainage and leveling is complete prior to installation.
- B. The surface to receive the synthetic turf must be inspected by the Installer, and prior to the beginning of installation, the Installer must accept the sub-base in writing. The acceptance will depend on the Base Constructor providing the Turf Supplier/Installer with test results indicating that compaction, planarity and permeability are in compliance with the synthetic turf manufacturer's specifications. The surface must be perfectly clean as installation commences and shall be maintained in that condition throughout the process. Acceptance shall be for tolerance to grade (1/4 inch in 10 feet in all directions).
- C. The compaction of the aggregate base shall be 95%, according to the Modified Proctor procedure (ASTM D1557), and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 1/4" from design grade. All must be verified by means of ASTM testing and surveys to the satisfaction of the turf Supplier/Installer and Owner.

3.3 INSTALLATION OF TURF SYSTEM

- A. The completed base and adjacent curbs/perimeter nailer shall be inspected by the Supplier/Installer by means of a laser and plotted on a 10-foot grid. Based upon the Supplier/Installer's inspection of the topographical survey, the Supplier/Installer shall fine grade the base suitably, including properly rolling and compacting the base to achieve a surface planarity within 1/4" in 10-feet (+0, -1/4"). SUPPLIER/INSTALLER SHALL NOT APPROVE THE BASE FOR TOLERANCE TO GRADE WITHOUT OBTAINING THE TOPOGRAPHICAL SURVEY.
- B. The Turf Supplier/Installer's Superintendent shall thoroughly inspect all synthetic turf materials delivered to the site both for quality and quantity to assure that the entire installation shall have sufficient material to maintain proper mixing ratios.
- C. Synthetic turf shall be loose-laid across the field, stretched, and attached to the perimeter edge detail. Synthetic Turf shall be of sufficient length to permit full cross-field installation. No head or cross seams will be allowed except as needed for inlaid fabric striping or to accommodate programmed cut-outs.

- D. All seams shall be flat, tight, and permanent with no separation or fraying. Field seams shall be sewn using double-lock stitch with cord recommended by the Manufacturer. Field seams will also be glued (if applicable) to seaming tape. Seaming tape is to be constructed of high tenacity coated, polyolefin. Inlaid markings shall be adhered to seaming tape with a high strength polyurethane adhesive applied per the Synthetic Turf Manufacturer's standard procedures for outdoor applications. All main fabric seams shall be transverse to the field direction; i.e., run perpendicularly across the field.
- E. Infill materials shall be properly applied in numerous lifts using special broadcasting equipment to produce a system of recycled SBR rubber particles. The synthetic turf shall be raked and brushed properly as the mixture is applied. The infill material shall be installed to a settled depth of approximately 1¾ inches. The infill materials can only be applied when the synthetic turf fabric is dry.
 - 1. Portable equipment shall be utilized to fully work-in the infill to all edges of the turf including curbs and nailer edges.

3.4 FIELD MARKINGS

- A. Field markings shall be installed in accordance with approved shop drawings.
- B. The field will have the following lines tufted, or inlaid according to FIFA Standards.

3.5 CLEAN UP AND PROTECTION OF THE SITE

- A. Protect installed turf from subsequent construction operations.
- B. Do not permit traffic over unprotected floor surface or running track, if applicable
- C. Supplier/Installer shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.
- D. All usable remnants of new material shall become the property of the Owner.
- E. The Supplier/Installer shall keep the area clean throughout the project and clear of debris.
- F. 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.

3.6 CLEAN UP

- A. Synthetic Turf Supplier/Installer shall provide the labor, supplies, and equipment, as necessary, for final cleaning of surfaces and installed items.
- B. The Synthetic Turf Supplier/Installer shall keep the area clean throughout the project and clear of debris.
- C. 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.

3.7 PROTECTION

- A. Prevent traffic over system for not less than 48 hours after installation

3.8 DEMONSTRATION AND TRAINING

- A. Provide a schedule for required maintenance, listing of banned products for field areas, and hands-on demonstration to be videotaped covering all aspects of maintenance and upkeep of the synthetic turf installation.
- B. Re-inspect the field areas and make necessary repairs, if any after one month of use. Check for infill displacement and tears in any seams, and correct deficiencies noted.

3.9 FIELD MAINTENANCE

- A. Perform regularly scheduled quarterly maintenance twice per year for five (5) years through the warranty period. The maintenance will include but not be limited to a complete inspection and repair including all materials and cleaners of all areas of the field including: Fiber fibrillation analysis, Seam analysis, Perimeter anchoring, Excessive wear analysis, UV fade inspection, Infill – consistency in depth, Infill – migration analysis, Glued inlay analysis, Base stability analysis, Painted marking inspection, Debris removal, Brushing, Aerating, Grooming, Removal of weeds and moss, Removal of stains, Keeping the infill level.
- B. The inspection and maintenance will be performed by the Turf Manufacturer's authorized maintainer. If the person is not the same as the previous visit, credentials shall be submitted for approval before the visit.
- C. The maintenance activities will include and not be limited to the most current Maintenance Guidelines of the manufacturer at the time of maintenance is being undertaken.

3.10 ENVIRONMENTAL CORPORATE RESPONSIBILITY (ECR)

- A. Donate and plant native trees (1.2M to 1.5M in height) at the start of construction, in places designated by the University, at the rate of one tree per 150 square meters of play area (football field). Use a variety of native tree species as specified by the University.
- B. Maintain tree saplings by watering and ring weeding during the construction period.
- C. Dead saplings within the construction period must be replaced with same species and height at least 30 days before project turn-over.

END OF SECTION 32 1813