

Specifications

Supplier name: PolyTurf • ACT

Product name: Xtreme Turf Royal Sport XTP60

This document provides the specifications for a Synthetic Grass Infill System composed of infill placed into a tufted polyethylene fiber component installed over a porous aggregate stone base including drainage system. There are variations in the final specifications as required by the Client.

Part 1 – General

1) Work Included

Provide all labor, materials, equipment, and tools necessary for the complete installation of a synthetic grass infill system as outlined in these specifications and a specially formulated resilient pre-mixed infill of rounded, coarse sand and coarse ambiently recycled rubber. The vertical draining field base shall be provided separately by an approved contractor. The system shall consist of but not necessarily be limited to the following:

- a) A complete synthetic grass system, consisting of a synthetic grass system with 2 1/4" inch long 100% monofilament polyethylene fibers (minimum of 7500 denier, 150 or 240 microns), tufted on a 1/2" gauge tufting machine with a minimum of 40 ounces of yarn per square yard. The system shall include a dimensionally stable, three component backing and have a minimum of 20 ounces of secondary backing per square yard. The finished product shall also include perforations to ensure maximum drainage.
- b) A resilient infill system, consisting of a coarse, rounded, uniformly sized sand and graded SBR crumb rubber.

2) Qualifications and Submittals

Prospective bidders and/or installers of the turf shall be required to comply with the following:

- a) Must be a member of the Sports Turf Managers Association (STMA).
- b) The turf manufacturer must be experienced in the manufacture of an infill synthetic grass system and provide references of ten (10) specific installations in the last three (3) years.
- c) Manufacturer must hold ISO 9001 (Quality) and ISO 14001 (Environmental) certifications.
- d) Must be a licensee of FIFA Quality Concept for Football Turf.
- e) The turf installer must provide competent workmen skilled in this specific type of synthetic grass installation. The designated supervisory personnel on the project must be competent in the installation of this material, including gluing seams and proper installation of the infill mixture.
- f) All designs, markings, layouts, materials shall conform to current National High School Federation/NCAA rules and other standards that may be applicable to this type of synthetic grass installation.

Part 2 - Synthetic Grass Materials

The synthetic turf material and resilient infill shall be in accordance with the following:

- a) The fiber shall be a minimum 7500 denier, 150 or 240 micron thickness 100% true monofilament polyethylene, low friction fiber, measuring not less than 2 1/4 inches high. The low friction fiber shall be specifically designed to virtually eliminate abrasion.

The tufted fiber weight shall not be less than 40 ounces per square yard. The fiber shall be tufted on a 1/2" tufting machine. The low friction non-abrasive fiber shall be 100% monofilament polyethylene, treated with a UV inhibitor. The primary backing shall consist of a three component backing. The secondary backing shall consist of an application of 20 ounces of coating per square yard, heat activated to permanently lock fiber tufts in place. The synthetic grass system shall be perforated to provide for maximum drainage. Non-perforated systems shall not be acceptable alternates for purposes of this specification.

The carpet rolls shall be of sufficient length to go from sideline to sideline of the football field. Head seams between the sidelines of the football field will not be acceptable.

All field lines, numbers and markings indicated on plans can be permanently inlaid or painted.

The fiber shall be green in color to simulate natural grass as closely as possible and treated with UV inhibitor, guaranteed a minimum of eight years.

The infill system shall consist of a non-compacting mixture of specifically graded, coarse, rounded, uniformly sized sand and coarse, ambiently recycled SBR crumb rubber.

Part 3 - Base and Drainage

An approved contractor shall provide a vertical draining field base consisting of a four-inch layer Open Graded Stone (OGS) and a two-inch layer of finish aggregate with a panel under a drain system installed upon a geotextile membrane. The panel drain is connected directly into a properly sized perimeter collector drain, which discharges into a designated storm water outlet.

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

b) 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 0.5% 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"
-100	3/4"
-50	3/8"
-40	#4
-12	#16
-5	#200

c) The Stone shall be installed maintaining a finished grade slope of 0.5%. The owner and Synthetic Turf System supplier 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.

d) 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.

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.

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

The sub-grade should no longer have any vegetation. The sub-grade shall then be treated with a weed-killer.

The bidder shall supply and install a geotextile fabric (Amoco 4545, Bidim, Terram 1000 or equal) over the entire surface before the installation of the stone depending on geographic location. Seams shall be overlapped a minimum of 12". The geotextile shall extend into and completely wrap the perimeter drainage ditch Multiflow™ (or equal) 1" x 12" panel drains shall be installed and secured over the geotextile, 30' on center, diagonally across the playing field in a barber pole design. The drains shall be terminated at the perimeter drain.

A properly sized perimeter drain, 8" to 12" in diameter, shall be installed in a properly excavated ditch, lined with geotextile. The CPPP (corrugated perforated plastic pipe) shall be sloped .05" per lineal foot toward the exit point to the existing storm drain.

One or more 2' x 2' catch basins may be installed at directional changes in the line, at the depth necessary to meet the elevation of the existing storm water evacuation line.

The bidder 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.

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

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

Any alterations must be agreed between all parties.

Part 4 - Execution and Installation

The turf installer shall strictly adhere to the installations procedures outlined under these sections. Any variance from these requirements shall be accepted in writing by the manufacturer's onsite representative, and submitted to the architect/owner, verifying that the changes do not in any way affect the warranty.

The turf installer will accept the aggregate base prior to the installation of the synthetic turf system. The compaction of the aggregate base shall be minimum 90% and the surface tolerance shall not exceed 3/16 inch in ten feet.

Extreme care should be taken to avoid disturbing the aggregate base both in regard to compaction and planarity. It is suggested that a 2-5 ton static roller be on site and available to repair and properly compact any disturbed areas of the aggregate base.

The full width rolls of synthetic grass shall be laid out across the field, and utilizing standard state-of-the-art gluing procedures each roll shall be seamed to the next. 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.

This is a 100% glued installation. Sewing of seams will not be permitted. The seaming tape and glue shall be intended for installation of outdoor synthetic turf surfaces. The infill material shall be spread evenly with a large fertilizer type spreader. The infill will be spread in strict accordance with the turf installer's specifications. Between each application of infill, the field area shall be brushed with a motorized rotary nylon broom. Minimum infill depth shall be 1.75 inches.

Part 5 –Maintenance and Warranty

The bidder and/or the turf manufacturer must provide the following:

- The turf manufacturer shall provide a warranty to the owner that covers defects in materials and workmanship of the turf for a period of eight years from the date of Substantial Completion. An eight (8) year "UV stabilization" warranty shall be included in the warranty.
- The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, acts of War and acts of God beyond the control of the owner of the manufacturer.
- The bidder shall provide a warranty to the owner that covers defects in the installation workmanship, and further warrant the installation was done in accordance with the manufacturer's recommendations.

- d) All turf warranties shall be limited to repair or replacement of the affected areas and shall include all necessary materials, labor, transportation costs, etc. to complete said repairs. All warranties are contingent on the full payment by the owner of all pertinent invoices.
- e) The warranty shall also guarantee a G-Max rating between 130 and 175 for a period of eight years from the date of manufacturing. The warranty shall state that if test results show that G-Max rating has not been met, the bidder shall take all steps necessary to correct the condition. The bidder shall provide adequate information to confirm that the corrective measures were successful.
- f) The bidder shall provide a maintenance program to the owner. The warranty shall be subject to compliance with said maintenance program.

Installation Experience

The Xtreme Turf system shall only be installed by certified installation crews. The Xtreme Turf installation crews will be supervised by industry veterans with proven experience. Experience includes infill and non-infill systems, demolition and removal, repairs or renovations, double crew-installations or regular single-crew installations.

Royal Sport XTP60 Standard Lab Testing

Test Method	Description	Results
ASTM F 355	GMAX shock absorption	97 average (rubber-sand) 82 average (rubber)
ASTM F 1551	Sports Shoe Traction – Coefficient of Friction – Static – Soccer	1.30 Dry 1.29 Wet
ASTM F 1551	Sports Shoe Traction – Coefficient of Friction – Dynamic – Soccer	0.88 Dry 0.85 Wet
ASTM F 1551	Sports Shoe Traction – Coefficient of Friction – Static – Football	1.48 Dry 1.44 Wet
ASTM F 1551	Sports Shoe Traction – Coefficient of Friction – Dynamic – Football	1.13 Dry 1.05 Wet
BS 7044 Method	Water Infiltration Rate	84 inches/hr
AATCC Method 20	Fiber Melting Point	130°C
ASTM D792	Grass Fiber Density – Specific Gravity	0.948
ASTM D2256	Grass Fiber Tensile Strength – Breaking	31.69 lbs/force
ASTM D2256	Grass Fiber Tensile Strength – Elongation	77.2%
ASTM D2256	Grass Fiber Tensile Strength – Tenacity	1.47 grams/denier

ASTM D1335	Tuft Bind	9 lbs/force
ASTM D5034	Grab Tear Strength – Length	259 lbs/force
ASTM D5034	Grab Tear Strength – Width	278 lbs/force
ASTM D2859	Flammability – Pill	PASS
TSI1201	Dimensional Stability Multiple (Temperature 30°F to 120°F and Humidity 20% to 80%)	-0.018" to +0.026" change
ASTM F1551	Relative Abrasiveness	Abrasive Index 12 ± 2

Royal Sport XTP60 Performance Lab Testing

Test Method	Description	Results	Natural Grass or FIFA Range
FIFA 10/05-01	Shock absorption after Lisport Wear test	60%	YES
FIFA 10/05-01	Shock absorption -5°C or 23°F	60%	YES
FIFA 10/05-01	Deformation (foot stability) after Lisport Wear Test	7.0 nm	YES
FIFA 10/05-01	Rotational Resistance/Traction after Lisport Wear Test	36 nm	YES
FIFA 07/05-02	Slip resistance scale	180 dry 163 wet	YES
FIFA 06/05-02	Slip resistance deceleration	5.3g dry 3.8g wet	YES
FIFA 10/05-01	Vertical ball rebound after Lisport Wear test	84 cm	YES
FIFA 03/05-02	Ball roll	6.8 mtr dry 6.7 mtr wet	YES
FIFA 02/05-02	Angled ball behavior dry	58%	YES
FIFA 02/05-02	Angled ball behavior wet	79%	YES
FIFA 09/05-02	Skin abrasion – dry	24	YES
FIFA 08/05-02	Skin / Surface friction	0.48	YES
EN ISO 20105A02	Pile yarn color change after artificial weathering	5	
EN 13864	Pile yarn change in tensile strength after artificial weathering	6%	
EN ISO 20105A02	Polymeric infill after artificial weathering – color and appearance	4-5 and No Change	
EN 12228 MethodB	Seam Strength	170 unaged / 98 water aged	
ISO4919	Turf Withdrawal Force	6.0 daN	
FIFA 12/05-01	Rubber granule infill residual compression and change in appearance	18% - no change	