

**ITEM NO. «#»      SYNTHETIC TURF - INFILL TYPE ON STONE BASE (SPORTS)**

**WORK:** Under this Item, the Contractor shall furnish and install **SYNTHETIC TURF-INFILL TYPE ON STONE BASE (SPORTS)** with shock pad in accordance with the plans, specifications, and directions of the Engineer.

**MATERIALS:** Unless otherwise specified herein, all materials and methods shall conform to the applicable portions of Section B, 'Materials and Methods of Construction'.

**Geotextile:** Geotextile shall be a nonwoven, rotproof, heavy weight synthetic geotextile necessary to provide reinforcement, separation of the base aggregate and subgrade soils, and filtration of water from the base aggregate to the subgrade soils. Fibers used in the manufacture of geotextiles, and the threads used in joining geotextiles by sewing, shall consist of long-chain, synthetic polymers, composed of at least 95 percent by weight polyolefins, polyesters, or polyamides. The geotextile and the threads used in sewing geotextiles, shall be resistant to chemical attack, rot, and mildew. The geotextile shall have no tears or defects which adversely alter its physical properties. They shall be formed into a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including selvages.

Geotextile shall conform to the following properties:

Property	ASTM Test	
Elongation	D4632	≥50%
Grab Strength (min)	D4632	710 N (160 lbs)
Tear Strength (min)	D4533	260 N (58 lbs)
CBR Puncture Strength (min)	D6241	1820 N (410 lbs)
Permittivity (min)	D4491	1.3/sec
Apparent Opening Size (max)	D4751	0.212 mm (0.0083 in) Std. No. 70 sieve

Nonwoven geotextile shall be Mirafi® 160N, as manufactured by TenCate, Pendergrass, GA, FX-60HS manufactured by Carthage Mills, Cincinnati, OH or approved equal.

**Under Drainage:** Under drainage shall be either slotted polyethylene pipe with full circular cross-section and/or a slim line drainage system in accordance with contract drawings. A slim line drainage system shall consist of drainage panels that is either a series of small interconnected corrugated round pipes wrapped in a non-woven, drainage geotextile or a structured high-density polyethylene perforated core that is thermally bonded to a geotextile. The Contractor shall not have the option of substituting the slim line drainage system where round pipe is shown (or vice versa). The drawings shall strictly be followed.

Pipe and fittings of both types shall be made from high density, virgin PE compounds that conform to the requirements of cell Class 324420C, as defined and described in ASTM D3350.

Slim Line Drainage System: Drainage panels for slim line drainage system shall comply with the requirements found in ASTM D7001 “Standard Specification for Geocomposites for Pavement Edge Drains and Other High-Flow Applications.” Drainage panels shall be Multi-Flow Drainage Systems manufactured by Varicore Technologies, Inc., Prinsburg, MN, Hydraway Strip Drain manufactured by Hydraway Drainage System, Caseyville, IL, or approved equal.

Drainage panels shall conform to the following minimum values:

<u>Core</u>	<u>Test Method</u>	<u>Value</u>
Panel Width, (in.)	N/A	12
Panel Thickness (in.)	N/A	1
Compressive Strength (psf)	ASTM D1621	6000
Flow Rate (gpm/ft)	ASTM D4716	20
<u>Geotextile</u>		
Grab Tensile Strength, (lbs.)	ASTM D 4632	100
Grab Elongation (%)	ASTM D 4632	50
Trapezoidal Tear (lbs.)	ASTM D 4533	40
Puncture (lbs.)	ASTM D 4833	50
Permittivity	ASTM D 4491	1.8
Apparent Opening Size (U.S. Std. Sieve Size, Max)	ASTM D 4751	70

Slotted Polyethylene Pipe: Circular pipe (N-12) manufactured for this specification shall comply with the requirements for test methods, dimensions, and markings found in AASHTO Designations M252 and M294. Pipe shall have an outer corrugated perforated wall and an essentially smooth inner wall (waterway). Corrugations for these sizes may be either annular or spiral. Size shall conform to the AASHTO classification "Type SP" (which describes pipes with a smooth waterway and Class 2 perforations). Pipe and fitting shall be manufactured by Advanced Drainage Systems, Ludlow, MA, or approved equal. The minimum parallel plate stiffness values when tested in accordance with ASTM D2412 shall be as follows:

<u>Diameter</u>	<u>Pipe Stiffness</u>
4" (100mm)	50 psi (340 Kpa)
6" (150mm)	50 psi (340 Kpa)
8" (200mm)	50 psi (340 Kpa)
12" (300 mm)	50 psi (340 Kpa)

Sock: The circular perforated pipe shall have a "DC Sock", a polyester machine knitted envelope factory applied and ready for installation. Sock is not required for the slim line drainage system.

Fittings: The fittings shall not reduce or impair the overall integrity or function of the pipeline. Fittings may be either molded or fabricated. Common corrugated fittings include in-line joint fittings, such as couplers and reducers, and branch or complimentary assembly fittings such as

tees, wyes, and end caps. These fittings may be installed by various methods, such as snap-on, screw-on, bell and spigot, and wrap around. Couplings shall provide sufficient longitudinal strength to preserve pipe alignment and prevent separation at the joints. Coupling of the pipes shall be performed using Standard ADS (Advanced Drainage Systems) N-12 split coupler PRO LINK ST, or PRO LINK 10.8, or PRO LINK 5, or approved equal. Only fittings supplied or recommended by the approved manufacturer shall be used. Where designated on the plans, a neoprene or rubber gasket shall be supplied.

Base Aggregate: Base aggregate shall consist solely of crushed ledge rock and shall be broken stone or gravel as defined in Section B, free draining, well graded, uniformly mixed washed stone aggregate. The total thickness of the base stone aggregate shall be six (6”) inches minimum. Base aggregate shall be a combination of base coarse aggregate with a fine top aggregate. The base coarse aggregate shall be four (4”) inches in thickness and the fine top aggregate shall be two (2”) inches in thickness after compaction. Materials shall meet the gradations below:

**Base Coarse Aggregate (3/4 inch material)**

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1 1/2”	100
3/4”	80 – 90
3/8”	30 – 65
No. 4	10 – 40
No.16	0 – 10
No.200	0 – 5

**Base Fine Top Aggregate (3/8 inch material)**

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1/2”	100
3/8”	85 – 100
No. 4	10 – 30
No.8	0 – 10
No.200	0 – 2

The aggregate must contain three and one-half to four percent (3½ - 4%) moisture content to ensure that fine particles don’t migrate and to facilitate proper compaction. The Contractor shall provide certification from the source plant that aggregate meets all requirements. If deliveries of base aggregate show segregation of sizes, material shall be deposited in stockpiles and thoroughly mixed prior to installation. **Bank run gravel, rounded sands and recycled concrete material shall be rejected for use as base aggregate.**

Recycled Plastic Lumber (RPL) Nailer: Synthetic turf shall be attached to RPL nailers placed around the perimeter of the field and the edges of any cutout areas, as shown on the contract drawings. The RPL nailer either three by six (3 x 6) or three by eight (3 x 8), unless otherwise approved by the Engineer.

Recycled plastic lumber shall be fabricated from one hundred percent (100%) recycled High Density Polyethylene (HDPE) and Low Density Polyethylene (LDPE), including UV-inhibiting

pigment, such as Molded Grade Plastic Lumber as manufactured by Plastic Lumber Yard, Norristown, PA, Structural Molded Plastic Lumber manufactured by Tangent Technologies, LLC, Aurora, IL, or approved equal. Minimum composition and mechanical properties shall be as follows:

Minimum High Density Polyethylene:	70%
Tensile Strength (ASTM D638):	1200 psi
Compressive Strength (ASTM D6108):	1200 psi
Flexural Modulus of Elasticity (ASTM D6109):	95,000 psi
Average Nail Pull Out Strength (ASTM D6117):	280 lbs

The Bulk Density and Specific Gravity of the recycled plastic lumber shall conform to the acceptable standards determined by the standard test method in ASTM D6111. Recycled plastic lumber shall not absorb moisture, corrode, rot, warp, splinter, or crack and the surface shall not be slippery when wet. Cross sections shall not show wide deep gaps or holes. Plastic lumber shall remain unpainted. RPL nailer will be totally below grade and therefore any color or combination of colors is acceptable.

Concrete Anchors: Recycled Plastic Lumber nailer shall be attached to the concrete curb with concrete anchors spaced twelve (12”) inches to thirty-six (36”) inches on center. Concrete anchors shall be a minimum of one-half inch diameter by four and one-half inches in length (1/2”x4-1/2”), embedment into concrete curb shall be a minimum of one and one-half (1-1/2”) inches. Concrete anchors shall be concrete wedge expansion type anchors, either stainless steel or hot dip galvanized (HDG), as manufactured by Hilti Inc., Plano, TX or Red Head, ITW Commercial Construction, Glendale Heights, IL, or approved equal.

Shock Pad: A system without a shock pad is NOT acceptable and will be rejected. Pad shall be free draining, constructed from either a porous cross link, closed cell polyethylene pad made of 90% recycled HDPE (High Density Polyethylene) or resilient expanded polypropylene, with a minimum thickness of twenty (20 mm) millimeters, such as one of the following:

- “ProPlay20 Sport” as manufactured by Schmitz Foam Products, Inc. Coldwater, MI,
- “SportLite HD20SL-NW3-SG” as manufactured by ThermaGreen Sport products Toronto, Canada,
- “Brock Shock Pad Series 20” manufactured by Brock USA LLC, Boulder, CO,
- Or approved equal.

Synthetic Turf: Synthetic turf shall be “PremierRS50” as manufactured by A-Turf, Williamsville, NY, “Classic Eco-E50” as manufactured by Shaw Sports Turf, Calhoun, GA, “Smart Grass” as manufactured by AFS Corporation, Fort Washington, PA, “Greenfields Allsport XP” manufactured by TenCate Grass, Dayton, TN, or approved equal. The system must meet all testing requirements listed in this specification.

Turf yarn shall be twisted parallel long-slit polyethylene tape, minimum ten thousand (10,000) denier, 100-micron, one hundred percent (100%) polyethylene non-abrasive fiber such as be TenCate Tapeslide XP, or Shaw High Performance Slit Tape, or approved equal. Monofilament

fibers are NOT acceptable under this specification. Pile weight shall be between fifty (50) and fifty-two (52) ounces per square yard. The fiber shall be treated with an ultraviolet (UV) inhibitor and guaranteed minimum eight (8) years against UV degradation and fading.

Tuft height shall be one and three-quarter (1-3/4") inch long fibers with a minimum of one and one-quarter (1-1/4") inches infill or more, to meet required G-max criteria. Turf shall be delivered in minimum twelve-foot (12') width rolls of sufficient length to run from sideline to sideline. Turf color shall be Verde, simulating natural grass, unless otherwise shown on the drawings or approved by the Engineer. The backing shall consist of a perforated primary and secondary backing with a minimum drainage rate of twelve (12") inches per hour. Primary backing shall be woven polypropylene. Secondary backing shall include a nonwoven membrane system with polyester additive featuring dimensional stability characteristics.

Synthetic Turf shall be in compliance with Article 27, Title 33 of the Environmental Conservation Law, "The Carpet Collection Program Law".

Synthetic Turf Infill Material: Resilient Infill shall be coated, sanitary, rounded, uniformly sized sand (silicon dioxide SiO<sub>2</sub>) or quartz made from virgin materials for synthetic turf systems. Sieve analysis shall show that material meets requirements for sieve sizes as described below but under no circumstances shall more than three (3%) percent pass the No. 30 sieve.

Infill shall be one of the following:

- Envirofill infill manufactured by US Greentech, LLC, Cincinnati, OH
- T° Cool Sports Sand manufactured by T° Cool PT, Cincinnati, OH
- RW Crystal Bright Infill manufactured by TTII, BC Canada
- OptFILL+ manufactured by Preferred Sands, Wayne PA
- Or approved equal.

Size of infill shall be graded between No.10 to No.20 mesh inclusive or No.16 to No.30 mesh inclusive. Color of coating or pigment shall be green or light tan in color unless otherwise shown on the plans or approved by the Engineer. Infill shall be low thermal absorption and low thermal capacity. The infill mixture composition proposed for the site shall be submitted for approval prior to installation.

**Tire derived SBR (styrene butadiene rubber) crumb infill product in any percentage will be rejected.**

Seam Tape: Seam tape shall be as recommended by the manufacturer. All seam tape shall be a minimum of twelve (12") inches wide.

Adhesive: Synthetic turf adhesive shall be either solvent based, one-part, thixotropic high green strength urethane, similar to NORDOT #34G as manufactured by Synthetic Surfaces, Inc., Scotch Plains, NJ, or two-component, thixotropic polyurethane based adhesive manufactured specifically for use on synthetic turf, such as STA-1000 Synthetic Turf Adhesive as manufactured by Sports Turf Direct, Finleyville, PA, or Ultrabond TurfPU 2K as manufactured by MAPEI, Deerfield Beach, FL, or an approved equal. Hot melt glue is NOT acceptable as an approved equal adhesive.

Hardware: Hardware for attaching synthetic turf to recycled plastic lumber shall be stainless steel or galvanized and as supplied by the approved turf manufacturer/installer.

G-max: The synthetic turf system shall have a g-max rating below 145 at installation and below 180 thereafter for the entire term of the warranty. If readings do exceed 180 within the warranty period, the manufacturer shall be responsible for whatever measures that are required to achieve g-max ratings below 180, as part of the warranty. (See Submittals)

**TESTING:** Synthetic turf materials must meet the following test requirements and criteria:

1. Infill- Aqueous Test: After infill material is prepared in accordance with EPA Method 1312 Synthetic Precipitation Leaching Procedure (SPLP), a total analysis shall be performed to determine heavy metal content in accordance with either EPA Method 6010D or EPA Method 6020B. Semi-volatile organic content shall be determined under Method 8270E and shall include data for aniline (CAS #62-53-3), phenol (108-95-2) and benzothiazole (95-16-9). Heavy metal content shall not exceed NYS DEC Groundwater Standards. Total lead (Pb) content shall not exceed .025 parts per million (ppm), total Chromium (Cr) content shall not exceed .05 parts per million (ppm), total Zinc (Zn) shall not exceed 2.0 ppm. The most updated EPA testing methodology shall be utilized for all testing. Testing shall be conducted by an accredited independent environmental laboratory in conformance with the National Environmental Laboratory Accreditation Program (NELAP) conference standards.
2. Synthetic Turf Fiber - Solid Digestion Test: The synthetic turf fiber should be tested as per ASTM F2765 – latest revision, “Standard Specification for Total Lead Content Synthetic Turf Fibers”. The total lead (Pb) content measured shall be less than 100 parts per million (ppm) and the total Chromium (Cr) content shall not exceed 25 parts per million (ppm). Testing shall be conducted by an accredited independent environmental laboratory in conformance with the National Environmental Laboratory Accreditation Program (NELAP) conference standards.
3. Independent Field Test for G-Max: After completion of synthetic turf, the Contractor shall engage the services of an independent laboratory capable of performing field tests utilizing ASTM F355 Test Method A, in accordance with ASTM F1936. Tests shall be conducted on two (2) separate visits. The first test shall be conducted after installation, but prior to the final acceptance of the work. The second test shall be conducted at one of the two follow-up visits required within the guarantee period. Both tests shall be performed with no visible frost on the ground.

**INSTALLATION:** Prior to beginning installation, the installer of the synthetic turf and pad shall inspect the aggregate base and supply a Certificate of Aggregate Base Acceptance for the purpose of obtaining manufacturer’s warranty for the finished synthetic playing surface. **The synthetic turf manufacturer’s representative and the Engineer must approve the permeable aggregate base installation prior to installation of the synthetic turf.** The Contractor shall perform all work necessary to obtain the installer’s written approval as part of the bid price of this item.

Excavation: Excavation of areas to receive synthetic turf shall be performed in accordance with the item “Unclassified Excavation”, specified elsewhere in this contract. However, payment for excavation performed in connection with the installation of synthetic turf shall be deemed included in the price bid for this item.

The area to receive synthetic turf shall be excavated to the correct depth, including peripheral drainage trenches, in accordance with the contract drawings. The subgrade shall be laser graded and pitched to ensure positive drainage (an average one-half percent (1/2%) from the center to the peripheral slotted pipe drainage lines), as indicated on the drawings, and all finished subgrade elevations verified with laser leveling instruments. The Contractor shall be careful to avoid over excavation. The geotextile shall be rolled directly over the prepared subgrade and the peripheral drainage trench, overlapping all seams a minimum of six inches (6”) in all directions.

SURPLUS: Excess material excavated by the Contractor shall be legally disposed of as part of the bid price of this item. Disposal of materials deemed as contaminated by the Engineer, if present, shall be paid for separately under respective contract items.

Under Drainage: Drainage panels shall be installed horizontally on compacted subgrade in the configuration and spacing indicated on the drawings. Panels shall be installed horizontally in close conformity to line and grade and shall have a full, firm and even bearing at each joint and along the entire panel. Panels shall be installed from the point of connection above the perforated collector pipe and progress up the slope to the high point shown on plans. Material shall be installed in strict accordance with the Manufacturer’s instructions.

All slotted polyethylene pipes shall be laid in reasonably close conformity to line and grade and shall have a full, firm, and even bearing at each joint and along the entire length of pipe and surrounded with the base aggregate drainage material. Joint misalignment shall not result in offsets, in the interior smooth liner, greater than one-quarter inch (1/4"). Pipe laying shall begin at the downstream end and progress upstream. Any single run of pipe, excluding end sections, shall consist wholly of the same type material unless otherwise directed by the Engineer. No section of pipe used shall be less than three feet (3') in length. Installation of the pipe shall be in accordance with ASTM D2321 – latest revision, “Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications”.

Connection(s) to drainage system (pipes or structures) shall be deemed included in the price bid for this item.

Base Aggregate: The base aggregate shall be installed in three (3) two (2”) inch lifts over the geotextile and compacted to a ninety percent (90%) Proctor Density, maintaining a consistent slope of one-half percent (1/2 %) from the centerline of the field to the sideline, unless otherwise shown on contract drawings. The base aggregate must be free draining, consistent with the vertical draining requirements of the synthetic turf manufacturer, and the surface of the field shall be perfectly level. The Contractor shall employ laser leveling devices to determine the correct subgrade and finished grade elevations.

Recycled Plastic Lumber Nailer: RPL nailer shall be installed around the perimeter of the field area and other locations shown on the contract drawings on a prepared level surface and attached to the concrete curb securely with specified concrete anchors.

Shock Pad: The shock pad shall be installed directly over the properly prepared base aggregate. The Contractor shall take extreme care to prevent disturbance of the base aggregate in regard to compaction and planarity. Any disturbed areas shall be rerolled with a four to six (4~6) ton roller, to the satisfaction of the Engineer.

Synthetic Turf: The full width rolls of turf shall be laid out across the field and the edges attached to the recycled plastic lumber perimeter attachment with a nail gun, or per manufacturer's directions, at maximum six inch (6") intervals. Head seams, other than at sidelines, is not acceptable.

Synthetic turf shall be installed with no wrinkles, ripples or bubbles. Slits in the fabric to relieve such defects are not permitted.

Seams: Adhesive installations shall be glued down with minimum twelve (12") inch wide textured seam tape. Adhesive shall be applied to entire width of seam tape. Sewing, where used, shall have stitches every one-quarter (1/4") inch or less. Thread shall be polyester or nylon, color to be green.

Rate of application for adhesive shall be a maximum of thirty (30) linear feet of seam tape per gallon of adhesive unless otherwise recommended by the manufacturer. Seams shall be compressed after glue application using a one- ton roller or approved equal methodology. Roll each seam a minimum of two (2) times to ensure adhesion.

Weather Restrictions: Where gluing of seams is proposed, the temperature must be 46 degrees F and rising. Do not deliver or install surfacing material if either ambient air temperature or material temperature is below 32 degrees F.

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. Permanent playing lines, if shown, shall be laid out and incorporated in the turf as shown on the drawings. Utility covers shall be marked on the surface with an inlaid white dot two (2") inches in diameter, unless otherwise shown on plans. Perimeter edge details required for the system shall be as shown on the drawings, as recommended by the manufacturer, and as approved by the Engineer.

Infill: The completed synthetic turf field shall be brushed with a motorized nylon rotary broom and the infill material immediately installed with a minimum four foot (4') width drop spreader. The infill shall be applied in two (2) lifts minimum to one and one-quarter inch (1-1/4") depth, totaling approximately nine pounds per square foot (9 lbs/sf) of infill material, and the infilled area brushed between each lift. Wet the area as necessary during installation to minimize dust.

Goal or Perimeter Playing Lines and Logos: Playing lines and/or logos shall be as shown on the drawings and shall be painted unless inlaid is specifically shown on the drawings. For primary playing lines, the turf color shall be white. Secondary lines shall be yellow (unless otherwise



shown on the drawings). Line painting shall be performed and paid for under the item “Paint Lines-4” Width– Synthetic Turf”.

Clean-Up: At the completion of the work, the Contractor shall remove accumulated debris, tools, equipment, containers, etc. from the site in an approved manner. The entire job shall be left broom clean and acceptable.

**FOLLOW-UP VISITS:** The Contractor shall prepay the synthetic turf manufacturer for two (2) follow-up visits at six-month (6 mo.) intervals after the Substantial Completion date. The visits shall be scheduled by the Resident Engineer to inspect the condition of the synthetic turf, infill material, drainage system, clay skinned areas (if any), and peripheral attachments. Items found to require repair, amendment, or replacement shall be the responsibility of the Contractor. Repairs, except those due to vandalism, shall take place immediately upon notification by the Resident Engineer.

**SUBMITTALS:** All submittals shall be as per General Conditions, Section C Special Provisions, Article 11.

Shop Drawings: Shop drawings shall be prepared at the scale of the construction documents, or larger, and shall contain all pertinent information regarding installation, including seaming plan, edge detail, field lines, logos, etc. These drawings shall be submitted for approval prior to the manufacturing and shipping of materials.

Installer Qualifications: The synthetic turf installer must demonstrate experience on at least five (5) installations of infill type synthetic turf. The synthetic turf manufacturer must certify the designated supervisory personnel on the project as competent. The Contractor shall submit the following:

1. A letter on turf manufacturer’s letterhead affirming the installer as competent in the installation of the material, including seams and proper installation of their product.
2. Proof of five (5) installations of infill type synthetic turf by the proposed installer.
3. Name, address, and phone numbers for a minimum of three (3) professional references associated with synthetic turf work performed by proposed installer.

Certificate of Aggregate Base Acceptance: The manufacturer/installer of the synthetic turf and pad shall inspect the aggregate base and supply a Certificate of Aggregate Base Acceptance for the purpose of obtaining manufacturer’s warranty for the finished synthetic playing surface. The Certificate of Aggregate Base Acceptance shall be on synthetic turf manufacturer’s representative letterhead.

Synthetic Turf Sample and Test Results: The Contractor shall submit an eighteen inch by twenty-four inch (18” x 24”) minimum sample of green turf carpet without infill material showing backing with perforations. Samples of additional turf colors, where shown, shall also be submitted. Sample warrantee shall be submitted for approval prior to approval of turf subcontractor. Certified copies of independent (third-party) laboratory reports shall be submitted certifying the following properties at a minimum:

- Pile Weight and Total Product Weight: ASTM D5848

- Primary and Secondary Backing Weights: ASTM D5848
- Tuft Height: ASTM D5823
- Tuft bind: ASTM D1335
- Grab/Tear Strength: ASTM D5034

Infill: Two (2) samples, each containing 3 oz. of the proposed infill material, along with sieve analysis shall be submitted for approval prior to installation.

Adhesive: Product literature shall be submitted prior to installation.

Seam Tape: Contractor shall submit a twelve (12") inch sample of the seaming tape the manufacturer is proposing to use.

Shock Pad: The Contractor shall submit an eighteen inch by twenty-four inch (18" x 24") minimum sample of the shock pad with manufacturer's product information for approval.

Base Aggregate: The Contractor shall submit a three-pound (3 lb.) bag of each of the proposed materials, with a sieve analysis and source of supply, for approval.

Geotextile: The Contractor shall submit manufacturer's data with sufficient detail to demonstrate compliance with the requirements of this specification and two labeled (2) samples, six inch by six inch (6" x 6") minimum, of the geotextiles intended for use in the work for approval and the Engineer's use. The label shall include the manufacturer's product name, the type of fabric, and the weight and grade of the material. Geotextiles used in the work shall conform to the approved samples.

Heavy Metal and Semi-Volatile Organic Content Testing: The Contractor shall submit test results from the approved independent laboratory showing that turf fibers and infill meet the requirements specified prior to shipping of materials.

Testing shall be conducted by an independent environmental laboratory accredited by the National Environmental Laboratory Accreditation Program (NELAP). The Contractor shall submit certification that the proposed laboratory is NELAP accredited to perform environmental analyses for the metals in question in both (a.) non potable water and (b.) solid and hazardous waste. If the laboratory is situated in the State of New York, NELAP accreditation must be provided by the New York State Department of Health Environmental Laboratory Approval Program (Wadsworth Center). Laboratories outside New York State may obtain this accreditation from any State that issues NELAP accreditation.

G-max Testing: The contractor shall submit g-max testing results showing that it meets the requirements of this specification.

Warranty: The Contractor shall submit a manufacturer's warranty listing, at minimum, an eight (8) year guarantee against UV fading, degradation, or defects, such as excessive wear or fibrillation, stipulated as more than a forty percent (40%) decrease in pile height, seam rupture, dislodgment, or inadequate drainage. The warranty shall also guarantee a G-Max rating below 145

at the time of installation and below 180 for the remaining term of the warranty. The warranty shall clearly state that if test results show that G-Max rating has not been met, the manufacturer will repair or replace product within the warranty period as necessary to meet those requirements at no cost to the City.

Maintenance Manuals: The Contractor shall submit Maintenance Manuals detailing all necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including any painting or markings.

**MEASUREMENT AND PAYMENT:** The quantity of **SYNTHETIC TURF-INFILL TYPE ON STONE BASE (SPORTS)** to be paid for under this Item shall be the number of **SQUARE FEET** of synthetic turf furnished and installed in accordance with the plans, specifications, and directions of the Engineer.

The price bid shall be a unit price per **SQUARE FOOT** of Synthetic Turf – Infill Type On Stone Base (Sports) and shall include the cost of all labor, equipment, and materials necessary or required to complete the work, including excavation, laser leveling of subgrade and finished grade, two types of base aggregates, shock pad, synthetic turf carpet, infill material, geotextile, under drainage, filter fabric wrap for perforated pipes, sock, fittings, connection(s) to drainage system, recycled plastic lumber nailer, concrete anchors, sealant, attachments, all necessary testing, two (2) follow-up visits, all delivery charges and submittals, all in accordance with the plans, specifications, and directions of the Engineer.

Ten (10%) percent of the total dollar amount for this item shall be withheld until the first Independent Field conducted G-max Test results are submitted and found acceptable to the Agency.

Detention system including detention/collector pipes, detention tanks, unclassified excavation for detention system and any broken stone beyond the six (6”) inch base aggregate shall be paid under separately under their respective contract items.

Painted lines, where shown on the plans, and Disposal of Contaminated Materials, if present, shall be paid for separately under their respective contract items.

---

**END OF PAGE**

---

**Rev. 06/03/2024 STANDARD**

**CONTRACTORS' ESTIMATE FOR ITEM NO. «#»**

Within fifteen (15) Days after the commencement date specified in the Notice to Proceed or Order to Work, unless otherwise directed by the Resident Engineer, the Contractor shall submit to the Resident Engineer a breakdown of its bid price for this item, showing the various operations to be performed under the Contract, in accordance with the progress schedule and the value of each of such operations, the total of such items to equal the exact amount of the Contractor's square foot price bid times the engineer's estimated quantity. Said breakdown must be approved in writing by the Resident Engineer. Each item of the detailed estimate shall include its proportioned share of overhead, profit, premium on bond, insurance and all other expenses involved, and the total amount for each of the items shall be summated, and this total shall in turn equal the exact amount of the total bid price for this item. The following is an example breakdown the Contractor may use:

DESCRIPTION		LABOR	MATERIAL	TOTAL
1.	Slotted Polyethylene Pipe or Drainage Panel			
2.	Base Aggregate			
3.	Shock Pad			
4.	Synthetic Turf Carpet			
5.	Coated Sand Infill			
6.	Recycled Plastic Lumber Nailer			
7.	Excavation/Fine Grading			
8.	Geotextile			
9.	Miscellaneous/ Testing			
<b><u>TOTALS:</u></b>				
<b>PRICE PER SQUARE FOOT:</b> (See bid sheet for estimated square feet required)				