ITEM 11610.03 M - SYNTHETIC TURF- INFILL TYPE (NYC DPR)

DESCRIPTION:

This work shall consist of furnishing and installing **SYNTHETIC TURF- INFILL TYPE** with rubber shock pad at locations indicated on the contract plans and as ordered by the Engineer.

MATERIALS:

A. Base Aggregate:

The base aggregate shall consist of crushed ledge rock and shall be broken stone or gravel, free draining, well graded, uniformly mixed washed stone aggregate. The total thickness of the base aggregate shall be 150 mm minimum and the Contractor shall have the option of using one of the types of base aggregate listed below:

A single lift of using Bottom Lift Material
or
Combination of two lifts: a bottom lift of 100mm thick minimum, and a top lift of 50 mm thick minimum.

The base aggregate shall meet the gradations shown below.

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Bottom lift Material

Percent Passing by Weight	Sieve Size
100	37.5 mm
80-100	19.0 mm
30-65	9.5 mm
10-40	4.75 mm
0-10	1.18 mm
0-5	75 mm

Top lift Material (optional)

Percent Passing by Weight	Sieve Size
100	13 mm
85-100	9.5 mm
75-100	6.3 mm
80-90	4.75 mm
35-75	2.36 mm
10-65	1.18 mm
0-40	0.59 mm
0-2	75mm

The aggregate shall contain three and one-half to four percent (3 ½ - 4%) of 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 this requirement. 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.

B. Rubber Shock Pad:

The rubber shock pad shall be eight millimeters (8mm) thick minimum:

Selected SBR rubber particles pad
Manufactured by Dodge-Regupol, Inc.
Lancaster, PA
(717) 295-3400

SBR rubber pad
Manufactured by Ultimate Systems Ltd.
Delphos, Ohio
(419) 692-3005

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SBR rubber pad
Manufactured by
RTH Rubber

Or equal as approved by the Engineer.

C. Synthetic Turf:

The synthetic turf shall meet the following requirements:

- Eight thousand (8,000) denier minimum one hundred percent (100%) polyethylene non-abrasive fiber.
- Treated with an ultraviolet (UV) inhibitor, guaranteed for eight (8) years minimum against UV degradation and fading.
- The G-Max rating shall not exceed a reading of 130 at installation and 180 thereafter, as per ASTM F 355, Test Method A.
- 57 mm long fibers (+/- 6 mm) with approximately 50 mm infill (+/- 13 mm), as necessary to meet required G-Max rating.
- The turf shall be delivered in 3.660 meters minimum width rolls of sufficient length to run from sideline to sideline.
- The color shall be Verde, simulating natural grass.
- The backing shall consist of a porous primary and secondary backing.

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The synthetic turf shall be as per:

Sofsport™
Manufactured by Hummer Sports Surfaces
LLC, Manheim, Pa
(800) 872-8873

Edel Grass
Manufactured by Stadium/Edel Grass
Charlotte, NC
(704) 846-6816

AstroPlay™
Manufactured by Southwest Recreational Industries, Inc.
Leander, Tx
(800) 233-5714

Or equal as approved by the Engineer.

D. Synthetic Turf Infill Material:

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The synthetic turf infill material shall meet the following requirements:

- Mixture of 6 mm rubber crumb and sand
  or
  100% of 6 mm rubber crumb

- Sand shall be:

  Clean rounded particles
  100% passing a #10 sieve
  Less 5% passing through a #200 sieve
  None passing through a #20 sieve,
  Meet ASTM C33 specifications

25% coarse,	2.0-5.0 mm particle size
50% medium,	0.5-2.0 mm particle size
25% fine,	0.025-0.5 mm particle size

The infill material composition shall be submitted to the Engineer for approval prior to installation. The approved infill materials shall be pre-blended by the manufacturer prior to delivery to the site.

E. Recycled Plastic Lumber Edge:

The Synthetic turf shall be attached to a recycled plastic lumber 152mm x 152mm nailer placed around the perimeter of the field and the edges of any cutout areas, as designated on the Layout drawing and as directed by the Engineer.

American Ecoboard, Inc.
Farmingdale, N.Y.
(516) 753-5151

Polywood, Inc.
(800) 915-0043

Or equal as approved by the Engineer.

The recycled plastic lumber shall meet the following properties:

- 100% High Density Polyethylene (HDPE) and Low Density Polyethylene (LDPE) recycled polyethylene
- Include UV-inhibiting pigment
- Minimum High Density Polyethylene: 70%
- Tensile Strength (ASTM D638): 20.6×10^3 kPa
- Compressive Strength (ASTM D6108): 20.6×10^3 kPa
- Flexural Modulus of Elasticity (ASTM 6109): 1.4×10^6 Mpa
- Slate Gray color

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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 D611. Recycled plastic lumber shall not absorb moisture, corrode, rot, warp, splinter, or crack and the surface shall not be slippery when wet. The recycled plastic lumber shall not contain any material that will be irritating when in contact with skin. Cross sections shall not show wide deep gaps or holes and the surface shall have a wood-like grain texture and appearance. Plastic lumber shall remain unpainted.

F. Reinforcing Bar:

All bar reinforcement for the installation of Recycled Plastic Lumber Edging shall meet the requirements of § 556.

G. Sealant:

The sealant shall be of a one part polyurethane elastomeric sealant. Sealant shall be resistant to water, diluted acids, and alkalis and the color shall match the recycled plastic lumber.

Sikaflex 1a,
Manufactured by Sika
Lyndhurst, NJ
(800) 933-7452

Or equal as approved by the Engineer.

H. Woven Filter Fabric:

The woven filter fabric hall be synthetic and rot-proof

AEF 300 W
Manufactured by American Engineering Fabrics, Inc. (AEF)
(718) 383-0300

FX66
Manufactured by Carthage Mills: T. Mina Supply, Inc.
(718) 397-5200

600X
Manufactured by Mirafi
(718) 461-2200

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Or equal as approved by the Engineer.

I. Slotted Polyethylene Pipe:

The pipe shall meet the following requirements:

- Circular cross-section
- With an outer corrugated perforated pipe wall and an essentially smooth inner wall (waterway).
- Corrugations may be either annular or spiral.
- Size of pipe shall conform to the AASHTO classification "Type SP" (pipe with a smooth waterway and Class 2 perforations).
- Pipe shall comply with the requirements for test methods, dimensions, and markings as indicated in AASHTO Designations M252 and M294.
- Pipe and fittings shall be made from Virgin PE compounds that conform with the requirements of cell Class 324420C, as defined and described in ASTM D3350.

Pipe and fitting
Manufactured by Advanced Drainage Systems
Ludlow, Ma
(800) 733-9080, Fax: (413) 589-7926
Or equal as approved by the Engineer.

The minimum parallel plate stiffness values when tested in accordance with ASTM D2412 shall be as follows:

Diameter	Pipe Stiffness
100mm	340 kPa
150mm	340 kPa
200mm	340 kPa

J. Sock:

The perforated pipe shall have a "DC Sock", a polyester machine knitted envelope factory applied and ready for installation.

K. Fittings:

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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 ADC (Advanced Drainage Systems) N-12 split coupler PRO LINK ST, or PRO LINK 10.8, or PRO LINK 5. Only fittings supplied or recommended by the pipe manufacturer shall be used.

CONSTRUCTION DETAILS:

Prior to beginning installation, the installer of the synthetic turf and pad shall inspect the subbase and supply a Certificate of Subbase Acceptance for the purpose of obtaining manufacturer's warranty for the finished synthetic playing surface.

The area to receive the resilient artificial turf shall be excavated to the correct depth, including peripheral drainage trenches for slotted polyethylene pipe. 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), and all finished subgrade elevations verified with laser leveling instruments. The Contractor shall be careful to avoid over excavation. Woven filter fabric shall be rolled directly over the prepared subgrade and the peripheral drainage trench, overlapping all seams a minimum of 150 mm in all directions.

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All slotted polyethylene pipe 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 as directed by the Engineer. Joint misalignment shall not result in offsets, in the interior smooth liner, greater than 6 mm. 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 1 meter in length. Installation of the pipe shall be in accordance with ASTM Recommended Practice D2321.

Recycled Plastic Lumber Edging shall be installed around the perimeter of the field area on a prepared level surface and drilled to receive the steel reinforcing rods, the rods hammered in place to 6 mm minimum below the lumber surface and the void filled with approved sealant.

The base aggregate shall be installed in two (2) lifts over the filter fabric 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. 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 of both first and second lift of base aggregate. The synthetic turf manufacturer's representative and the Engineer must approve the base aggregate installation prior to installation of the synthetic turf.

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The rubber 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 rolled again with a four (4)to six (6) metric ton roller, to the satisfaction of the Engineer.

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, as per manufacturer's directions, at maximum 305mm intervals. The seams shall be double sewn or glued as per manufacturer's directions and head seams, other than at sidelines, shall not be acceptable. 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.

The completed synthetic turf field shall be brushed with a motorized nylon rotary broom and the infill material immediately installed with a minimum 1.220 meter width drop spreader. The infill shall be applied in a minimum three (3) lifts to at least on 38mm depth, totaling at least 191.5 N/m^2 of infill material, and the infilled area brushed between each lift.

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Follow-Up Visits:

The Contractor shall prepay the resilient synthetic turf manufacturer for two (2) follow-up visits at six month (6 mo.) intervals after the Final Inspection date. The visits shall be scheduled by the EIC to inspect the condition of the synthetic turf, infill material, drainage system 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 EIC.

Submittals:

The following shall be submitted for approval and record:

- Shop Drawings: Shop drawings shall be prepared at the scale of the construction documents, or larger, and shall contain all pertinent information regarding installation. These drawings shall be submitted to the Engineer for approval prior to the manufacturing and shipping of materials.
- Certificate of Subbase Acceptance: Acceptance of subbase shall be on synthetic turf manufacturer's representative letterhead.
- Installer Qualifications: The resilient synthetic turf Sub/Contractor must demonstrate experience on at least five (5) installations of the proposed material. The designated supervisory personnel on the project must be certified by the synthetic turf manufacturer. A letter on manufacturer's letterhead must be submitted affirming the Sub/Contractor as competent in the installation of the material, including seams and proper installation of their product.
- 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 130 at the time of installation and below 180 for the remaining term of the warranty. 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 State.
- Synthetic Turf Sample: The Contractor shall submit an eighteen inch by twenty four inch (18" x 24") or 457mm x 610mm minimum sample of the synthetic turf and infill system proposed for use for approval of color, manufacture, and infill system prior to ordering the material.
- Maintenance Manuals: Prior to final acceptance, the Contractor shall submit three (3) copies of Maintenance Manuals, which shall include all necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including any painting or markings.

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- Maintenance Equipment: A foldable "field drag brush" (approximately 1.220m x 1.830m) in size shall be delivered and stored at the site at a location as designated by the Engineer. The drag brush shall be a continuous nylon bristle material, or approved equal, as recommended by the synthetic turf manufacturer and approved by the Engineer. After completion of synthetic turf installation and acceptable subsequent inspections by the Engineer an Manufacturer, the "field drag brush" shall be provided to the Engineer to provide to New York City Parks M&O personnel to maintain and groom the field in the future.
- Rubber Shock Pad Sample: The Contractor shall submit a 457mm x 610mm minimum sample of the rubber pad for approval.
- Base Aggregate Sample: The Contractor shall submit a 2.27kg bag of each of the two (2) proposed materials, with a sieve analysis, for approval. A duplicate set of samples shall be sent to the synthetic turf manufacturer.
- Independent Field Test Results: After completion of synthetic turf, the Contractor shall engage the services of an independent laboratory capable of performing field tests utilizing ASTM 355 Test Method A. 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.

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METHOD OF MEASUREMENT:

This work will be measured as the number of square meters of **SYNTHETIC TURF- INFILL TYPE** furnished and installed in accordance with the plans, specifications, and as directed by the Engineer.

BASIS OF PAYMENT:

The unit price bid per **square meter** of Synthetic Turf-Infill Type shall include the cost of all labor, equipment, and materials necessary to complete the work, and the two (2) follow-up visits.

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