

ITEM NO. <<#>>

**SYNTHETIC TURF –TUFTED NYLON ON STONE BASE
(MULTI-USE/NON-SPORTS)**

WORK: Under this item, the Contractor shall furnish and install **SYNTHETIC TURF – TUFTED NYLON ON STONE BASE (MULTI-USE/NON-SPORTS)** with shock pad in accordance with the plans, specifications and directions of the Engineer.

MATERIALS: Unless otherwise specified herein, all materials and methods of construction shall comply with 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 nailer placed around the perimeter of the field and the edges of any cutout areas, as shown on the contract drawings. The RPL nailer shall be 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. 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. 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. 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), manufactured by Hilti Inc., Plano, TX or ITW Red Head, Glenview, IL, or approved equal.

Shock Pad: There shall be one shock pad, either factory bonded or loose laid and then 100% glued to the carpet by the Synthetic Turf Installer. A system without a shock pad is not acceptable and will be rejected. Shock Pad shall be free draining and shall be one of the following:

- Factory bonded, closed cell foam pad, eight (8) mm thick minimum
- A porous cross link, closed cell polyethylene pad made of 90% recycled HDPE (High Density Polyethylene) or resilient expanded polypropylene, twenty (20) mm thick minimum, such as:
 - “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,
- A poured-in-place E-layer with shock attenuation capabilities may be proposed, weather permitting. Shock pad must be free draining after application of adhesive to secure carpet to E-layer.
- Or approved equal.

Synthetic Turf Carpet: Synthetic turf carpet shall be of tufted nylon construction, using 100% nylon 6.6 textured pile fiber ribbon and polyester high-tenacity filament backing yarns, such as “SmartTurf” as manufactured by AFS Corporation, Fort Washington, PA, “Pure Grass Nylon Surfacing” as manufactured by AstroTurf, Dalton, GA, “Elevate 50NY”, as manufactured by Shaw Sports Turf, Calhoun, GA, or approved equal. Carpet/pad shall include factory drilled holes for drainage. Synthetic turf carpet shall be either factory bonded or 100% glued to the shock pad. Gluing/bonding shall be done in a manner which does not impede drainage characteristics. Nylon

fibers shall be tested for heavy metal content as described below. Any nylon fibers exceeding specified lead limits shall be rejected. Tuft height shall be minimum one (1”) inch and maximum one and one half (1 1/2”) inch long fibers. 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. Synthetic turf shall be resistant to insect infestation, rot, fungus, mildew, ultra-violet light and heat degradation. It shall have flow-through drainage (both turf and pad) allowing free movement of surface run-off through turf and pad. 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”.

NOTE: An additional shock pad is NOT required if a factory bonded pad is included in the synthetic turf carpet product selected.

Pile weight shall be between fifty (50) and sixty (60) ounces per square yard. The fiber shall be treated with an ultraviolet (UV) inhibitor and guaranteed minimum ten (10) years against UV degradation and fading.

Seam Tape: Seam tape shall be as recommended by the manufacturer and a minimum of twelve (12”) inches wide and shall be used to seam the base shock pad as well as the carpet with factory bonded pad, resulting in a continuous resilient surface with no gaps.

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.

HEAVY METAL TESTING: The synthetic turf fiber shall be tested in accordance ASTM F2765 “Standard Specification for Total Lead Content Synthetic Turf Fibers” or latest rev. 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.

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 specification "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 the synthetic turf shall be excavated to the correct depth, including peripheral drainage trenches, where shown in drawings 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), as indicated on the drawings, and all finished subgrade elevations verified with laser leveling instruments. The Contractor shall be careful to avoid over excavation. 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, in accordance with the plans, specifications, and directions of the Engineer. 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.

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: The 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: If a separate shock pad is proposed, it shall be loose laid directly over the properly prepared base aggregate, then seamed using joint tape and adhesive. 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. Seam tape shall be applied to seams of shock pad using spray adhesive or spread adhesive on seam tape using flat steel trowel. Adhesive shall be applied to entire width of seam tape. Rate of application 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 applications using a minimum one ton roller or equivalent. Roll each seam a minimum of two times to ensure adhesion. Seams shall be flat, tight, and permanent with no separation.

After the seams are glued, the shock pad shall be glued to the synthetic turf carpet utilizing an adhesive that is water-drainable such as NORDOT #34S-3(Plus), or approved equal.

Synthetic Turf Seams: After the shock pad has been installed (unless a factory bonded pad is being used), seamed and inspected, tufted nylon carpet shall be installed directly over the shock pad. All seams shall be glued using seam tape and approved adhesive.

Rate of application shall be a maximum of thirty (30) linear feet of seam tape per gallon of adhesive unless otherwise recommended by the manufacturer. Hot melt glue is NOT acceptable as an approved equal adhesive.

The full width rolls of turf shall be laid out across the field in an opposite direction to the shock pad and the edges attached to the recycled plastic lumber perimeter attachment with a nail gun, or as per manufacturer's directions, at maximum six inch (6") intervals.

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

Carpet seams shall be compressed after glue applications using a minimum one ton roller or equivalent. Roll each seam a minimum of two times to ensure adhesion. 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. Drains shall be marked on the surface with an inlaid white dot two (2") inches in diameter, unless otherwise shown on contract drawings. 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.

Weather Restrictions: When applying adhesives, there shall be no precipitation on the day of installation and 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.

Playing Lines and Logos: Playing lines and logos shall be as shown on the drawings and shall be painted unless otherwise 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 DPR Standard 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 (6) month intervals after the Substantial Completion date. The visits shall be scheduled by the Resident Engineer to inspect the condition of the synthetic turf, 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 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, etc. These drawings shall be submitted for approval prior to the manufacturing and shipping of materials.

Installer Qualifications: The synthetic turf Sub/Contractor must demonstrate experience on at least five (5) installations of the proposed material. The synthetic turf manufacturer must certify the designated supervisory personnel on the project as competent. The Contractor shall submit for approval, the name and qualifications of the proposed sub/Contractor. The Contractor shall submit the following:

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

Certificate of Aggregate Base Acceptance: Prior to the beginning of installation, 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 the synthetic turf manufacturer’s representative letterhead.

Synthetic Turf Sample and Test Results: The Contractor shall submit two (2) eighteen inch by twenty- four inch (18” x 24”) minimum samples of green turf carpet material with or without factory bonded pad 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

Heavy Metal Testing: Heavy metal testing must be conducted by qualified lab as described below. Testing shall be as described under Heavy Metal Testing paragraph. A separate test must be conducted for every color fiber to be installed.

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.

Adhesive: Product literature of seaming adhesive and adhesive for bonding the synthetic turf to shock pad, when proposed, shall be submitted prior to installation.

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

Shock Pad: Where a separate shock pad is proposed, 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. This sample may be waived if a factory bonded shock pad is proposed.

Base Aggregate Sample: 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.

Warranty: The Contractor shall submit a manufacturer's warranty listing, at minimum, a ten (10) 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 warrantee must provide coverage for ten (10) years starting on the date of Substantial Completion.

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 –TUFTED NYLON ON STONE BASE (MULTI-USE/NON-SPORTS)** to be paid for under this item shall be the number of **SQUARE FEET** of turf furnished and constructed in accordance with the plans and specifications and directions of the Engineer.

The price bid shall be a unit price per **SQUARE FOOT** of Synthetic Turf –Tufted Nylon On Stone Base (Multi-Use/Non-Sports) installed complete and shall include the cost of all labor, materials, equipment and incidental expenses necessary to complete the work including excavation, laser leveling of subgrade and finished grade, base aggregates, synthetic turf carpet with factory bonded pad or shock pad, adhesive, seam tape, geotextile fabric, under drainage, filter fabric wrap for perforated pipes, fittings, hardware, recycled plastic lumber nailer, concrete anchors, attachments, all necessary testing, all delivery charges and submittals, all in accordance with the plans, specifications, and directions of the Engineer.

Detention system including detention/collector pipes, detention tanks, unclassified excavation for detention system and any broken stone beyond the six (6”) inch base aggregate described in this specification shall be paid for 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.

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Rev. 06/04/2024 STANDARD

CONTRACTORS' ESTIMATE FOR ITEM «#»:

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	MAT'L.	TOTAL
1.	Slotted Polyethylene Pipe or Drainage Panel			
2.	Aggregate Base			
3.	Synthetic Turf Carpet with pad			
4.	Recycled Plastic Lumber Nailer			
5.	Excavation/Fine Grading			
6.	Geotextile			
7.	Miscellaneous / Testing			
<u>TOTALS:</u>				
PRICE PER SQUARE FOOT: (See bid sheet for estimated square feet required)				