ADDENDUM NO. 1

September 01, 2022

Greensburg Community High School
Stadium & Site Improvements:

1000 E. Central Ave.
Greensburg, IN 47240

TO: ALL BIDDERS OF RECORD

This Addendum forms a part of and modifies the Bidding Requirements, Contract Forms, Contract Conditions, the Specifications and the Drawings dated August 9, 2022, by Fanning/Howey. Acknowledge receipt of the Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of Pages 1-1, and attached Fanning/Howey's Addendum No. 1, dated August 29, 2022, consisting of 2 Pages, Specification Sections 32 18 13 Synthetic Grass Surfacing and 32 18 24 – Running Track Surface.

A D D E N D U M N O. 1

Greensburg Community High School Stadium and Site Improvements

Greensburg Community School Corporation
Greensburg, Indiana

Project No. 221055.06

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Addendum No. 1, 1 item, 1 page
Revised Project Manual Sections: 32 18 24 – Running Track Surface and ~~32 18 30~~ – Synthetic Grass Surfacing

Date: August 29, 2022

FANNING/HOWEY ASSOCIATES, INC.
ARCHITECTS/ENGINEERS/CONSULTANTS

William E. Payne, AIA
Indiana Registration No. 4169

TO: ALL BIDDERS OF RECORD

ADDENDUM NO. 1 to Drawings and Project Manual, dated August 9, 2022, for Greensburg Community High School – Stadium and Site Improvements, Greensburg Community School Corporation, Greensburg, Indiana 47240; as prepared by Fanning/Howey Associates, Inc., Indianapolis, Indiana.
This Addendum shall hereby be and become a part of the Contract Documents the same as if originally bound thereto.

The following clarifications, amendments, additions, revisions, changes, and modifications change the original Contract Documents only in the amount and to the extent hereinafter specified in this Addendum.

Each bidder shall acknowledge receipt of this Addendum in his proposal or bid.

NOTE: Bidders are responsible for becoming familiar with every item of this Addendum. (This includes miscellaneous items at the very end of this Addendum.)

RE: ALL BIDDERS

ITEM NO. 1. REVISED PROJECT MANUAL SECTIONS

A. Revised Project Manual Sections 32 18 24 – Running Track Surface and 32 18 30 – Synthetic Grass Surfacing are included with and hereby made a part of this Addendum.

END OF ADDENDUM

SECTION 321813 - SYNTHETIC GRASS SURFACING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

B. Section Includes:
   1. Synthetic grass infill system and accessories for Football and Soccer field.
      a. New synthetic grass infill system on new base and subgrade.

C. Related Work:
   1. Division 31 Section “Site Clearing”: For removal of existing synthetic grass surface.
   2. Division 31 Section “Earth Moving”: For preparation of subgrade and field base materials.
   3. Division 33 Section “Sub-drainage”: For storm drainage structures and field drainage system.

1.2 DEFINITIONS

A. Terminology Definitions:
   1. Base Materials: Materials that provide porosity and stability such as crushed aggregate or porous pavement.
   2. Denier: The weight in grams of 9000 meters of fiber.
   3. Drainage System: A method of removing surface and subsurface moisture/water.
   4. Fiber: A specific form of fibrous textile material from which yarn is manufactured.
   5. Fiber Thickness: A measurement in microns (metric) or mils. (U.S.) of the thinnest cross section of a fiber.
   6. G-Max: A measurement of impact (shock absorption) in terms of gravity units as a ratio of deceleration.
   7. Infill: Loosely dispersed materials that are added to the synthetic turf system, typically sand, rubber, other suitable material, or a combination thereof.
   8. Knitted: A process in which the yard fibers of the pile are tied to the backing which was simultaneously constructed in the same over and under, crisscross process.
   9. Water Permeability: The rate at which water flows through a surface or system cross-section or components of the cross-section.
   10. Planarity: Uniformity of the surface as compared to certain fixed predetermined points or prescribed slopes.
   11. Primary Backing System: A single or multiple layers of woven or non-woven materials, into which the fiber is either tufted or knitted, to provide the initial construction of the synthetic turf.
   12. Secondary Backing System: A coating and/or woven or non-woven fabric layer(s) applied to the primary backing after the fiber pile has been locked into place which serves to provide tuft bind and additional structural integrity.
   13. Shock Absorbing System: Component(s) that add resiliency to the system.
   14. Subgrade: A stabilized foundation onto which the base materials and field systems are installed.
   15. Synthetic Pile Fiber: Grass-like blades made of synthetic materials.
   16. Tufted: A process by which the fiber yarns that form the pile are inserted into a previously prepared blanket-like primary backing.

1.3 PERFORMANCE REQUIREMENTS

A. General: Design of synthetic turf system is based on products and systems by manufacturers as specified in Part 2. Systems shall be engineered by manufacturer to provide a complete turf system.

B. Standard Test Methods: Systems shall comply with all applicable test standards as follows:

1. ASTM F 1551; “Standard Test Methods for Characterization of Synthetic Turf Playing Surfaces and Materials.”
    a. Suffix-DIN 18-035, Part 6 – Water Permeability of Synthetic Turf Systems and Permeable Bases.
    b. Suffix ASTM – Turf System Ball Bounce and Ball Rebound.
2. ASTM D-1682; Grab Strength Test
3. ASTM D-1335; Tuft bind
4. ASTM D-4158; Uniform Abrasion Method
5. ASTM F-1015; Relative Abrasiveness
6. ASTM F-355; Procedure A; Shock Absorbency
7. ASTM D-1876; Peel Resistance

C. Field Markings: Conform to requirements of the National Federation of State High School Association’s High School Track and Field Rules and Records.

D. Shock Absorbency: Field shall achieve a minimum of 130 Gmax Shock Absorbency at all tested locations and a maximum of 175.

E. Player-Surface Interface, ASTM F1936: The field surface should provide consistent footing across the entire field area in all directions. Footing includes traction, slip resistance, and rotational resistance. It should also allow for movement between the shoe and the field surface so that contact can be made between athletes without the foot locking into place.
1. Traction: The surface should provide good traction in all types of weather with the use of conventional athletic type shoes applicable to the sports and/or activity specified.
2. Rotational Resistance: The surface should allow for twisting movements as is common in athletic activities. Rotational resistance measures the ability of the user to perform twisting motions when in contact with the surface.
3. Slip Resistance Component: The system should enable a predictable range of movement between the user and the surface uniformly throughout. The surface should balance traction and slippage by way of the sliding coefficient.
4. Surface Abrasiveness: The field surface should have fibers that minimize skin abrasions.
5. Impact Absorption (force reduction): The field surface should have the ability to adequately absorb player impact with the surface.
6. Surface Stability (vertical deformation): The surface should provide adequate stability so that the athlete can maintain body control to help prevent or properly control contact between athletes. This is an important consideration that should be balanced with the surfaces’ ability to absorb impact. If the surface is too soft, the stability provided by the field may not be optimal for player movement and body control.

F. Ball-Surface Interface, ASTM F1936: The field surface should provide consistent and predictable ball performance reaction characteristics.
1. Surface Uniformity: The synthetic turf playing field should be as level as practical. The synthetic surface shall provide a true and uniform playing surface throughout.
2. Ball Bounce: The synthetic turf field should provide a ball bounce as close to the optimal playing characteristics of the sport or sports. The published standards for the regulatory organizations as applicable for each sport should be referenced.
3. Ball Roll: The synthetic turf field should provide a ball roll as close to optimal playing characteristics of the intended sport or sports. The published standards for the regulatory organizations as may be applicable for each sport should be referenced.

G. Appearance: Unless otherwise dictated by design, the synthetic turf should have a consistent color and shade without significantly noticeable streaks or other irregularities when observed in any direction.

1.4 SUBMITTALS

A. Shop Drawings: Prepare at scale of the construction documents and contain all pertinent information regarding installation. Drawings shall include the following:
1. Seaming plan; seams of pad are not to coincide with seams of synthetic turf or interfere with subsurface drainage system.
2. Installation details; edge detail, goal post detail, other inserts, etc.

3. Striping plan; layouts for football and soccer showing any field lines, markings and boundaries, and field logos as indicated.

B. Samples for Verification: Synthetic Turf, 30 inches by 30 inches with two 4 inch by 12 inch lines, (1 white and 1 yellow), installed per manufacturers recommended method.
   1. Color samples of A/E selected colors to match School colors.

C. Product Quality Assurance/Control Submittals:
   1. Product Data: For each type of product indicated.
   2. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency for turf system performance.
      a. Compliance with Pile Height, Face Weight and Total Fabric Weight per ASTM D418.
      b. Primary and Secondary Backing Weights per ASTM Dd418.
      c. Tuft Bind per ASTM D1335.
      d. Grab Tear Strength per ASTM D1682.
   3. Certification of Sub-base, drainage system and aggregate base installation: Manufacturer/installer shall certify acceptance of sub-base, storm drainage system and aggregate base for the purpose of obtaining manufacturer's warranty for the finished synthetic playing surface.
   4. Certification of Installer: Proof of compliance with "Quality Assurance" provisions.
   5. Warranty: Manufacturer's warranty with provisions specified herein that will be utilized for the Project. Generic warranties are not acceptable.

D. Closeout Submittals:
   1. Maintenance Data: For the proper care and preventative maintenance of the synthetic turf system, including painting and striping.
   2. Warranties: Special Warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Manufacturer/Installer's
   1. The synthetic turf installer/manufacturer shall demonstrate experience with at least 3 similar projects with contract amounts over $1,500,000.00. Submit information with the bid.
   2. The installer/manufacturer shall employ only qualified, experienced supervisors and technicians skilled in the installation of this system. All turf technicians shall be full time statutory employees of the turf manufacturer/installer. Submit resumes of the top 5 technicians and 2 supervisors with the bid.
   3. The turf installer/manufacturer must provide competent workmen skilled in this specific type of synthetic grass installation. The designated supervisory personnel on the project must be certified in writing by the turf manufacturer as competent in the installation of this material, including seaming and proper installation of the infill mixture. The manufacturer shall have a representative on site to certify the installation and warranty compliance.
   4. The manufacturer's representative and installation project manager shall observe establishment of subgrade, drainage system, and perimeter drain at periodic intervals during construction and notify the Architect of any items observed that may be detrimental to final installation of the synthetic turf.
   5. The Manufacturer must be a certified member of the Synthetic Turf Council (STC).
   6. Have proper license, in good standing, and have never had a license revoked.
   7. Have not been disqualified or barred from performing work for any public Owner or other contracting entity.
   8. Identify the foreman, supervisor and crew experience for the team executing this project installation. Include a list of completed projects in the last three(3) years by this specified team.
   9. Contractor to provide independent laboratory testing data, such as Lisport testing or similar, to substantiate the comparative durability of the proposed synthetic system the other competing systems that may be offered for the Owner's consideration.
   10. Provide documentation of sources of infill materials. Local and regional sources are encouraged whenever possible.

11. Impact testing: The contractor shall engage a third-party testing agency to perform GMAZ testing at substantial completion. No fewer than eight (8) locations on field shall be collected to compile a diverse, random assessment of the field. The intent of testing is to document newly constructed conditions for analysis and benchmarking in subsequent years. Initial construction is not anticipated to exceed GMAX 175.

1.6 WARRANTY

A. Turf Warranty: Within base response, the Contractor shall provide an 8-year warranty for outdoor applications and 2-year warranty for indoor applications. The follow conditions shall apply, when applicable:
   1. Coverage shall be for the full system, including drainage function, UV degradation, fiber strength, stability of the backing, tufted yarn and seam integrity, base construction, and all other related components of the synthetic turf system.

B. Manufacturer's Warranty: Manufacturer shall warrant artificial grass against defects in the material provided, including ultraviolet degradation, excessive fading, wrinkling, panel movement, shock absorbency, etc.
   1. The warranty submitted must have the following provisions even if not part of Manufacturer's standard Warranty form.
      a. Warranty Period: Eight (8) years from date of Substantial Completion.
      b. Warranty shall include materials and workmanship.
      c. Must have a provision to either make a cash refund or repair or replace such portions of the installed materials that are no longer serviceable to maintain a serviceable and playable surface.
      d. Must be a warranty from a single source covering workmanship and all self-manufactured or procured materials for the field surface and installation.
      e. Warrant that the yarn used to make the grass-like tufts will maintain its UV stability and tensile strength such that the strength of the fiber when measured in accordance with ASTM D-2256 will not decrease by more than 50% during the warranty period due to breakdown of UV stability.
      f. All warranties shall be in writing and remain valid should the manufacturer be acquired by another company prior to the conclusion of said warranty.

C. Attic Stock: Provide the Owner with a palette of crumb rubber "attic stock" material (2,000 lbs in either 50 lbs individual-wrapped bags or a single oversized bag) at the conclusion of the project for their future use. Ensure the material is an exact match to the approved and installed rubber ballast on the field.

1.7 MAINTENANCE SERVICE

A. Maintenance Proposal: Provide a separate maintenance proposal, not included in base bid, from manufacturer/installer to the Owner in a form of a standard one-year maintenance agreement. State the services to be provided, obligations, conditions and terms for agreement period and for future renewal options.

1.8 EXTRA MATERIALS

A. Furnish one additional standard infill container with rubber infill for the owners use. Container shall contain a min of 45 c.f. of rubber infill material.

B. Furnish roll of additional synthetic turf fabric for owners use. Roll shall contain a min. of 2000 s.f of turf fabric.
   1. All salvageable pieces of colored turf used during the installation should be left with the Owner.

C. Maintenance Equipment:
   1. FieldSpec 7' Drag Brush
   2. FTMAG 7' Tow Behing Magnet

PART 2 - PRODUCTS

2.1 MANUFACTURERS/PRODUCTS

A. Varsity Football Stadium - Manufacturer: Subject to compliance with requirements, provide products from.
   1. Motz Group; “24/7”, Cincinnati, Ohio.
   2. Fieldturf / Tarkett “XT-57-48”, Calhoun, Georgia.
   3. Astroturf; “Rhino SF”, Pittsburgh, Pennsylvania.
   4. Sprinturf; “Ultrablade”; Atlanta, Georgia
   5. Act Global, SPEED S5-M, Austin, Texas

B. Products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product. Requests for Architect’s approval must be accompanied by the “Substitution Request Form” and complete technical data for evaluation. All materials for evaluation must be received by the Project Manager and Specification Department at least 10 days prior to bid due date. Additional approved manufacturers will be issued by Addendum.
   1. With substitution request, manufacturer must submit all information in a matrix format that provides the same product information in the format of Article 3.7.

2.2 SYSTEM COMPONENTS

A. Drainage System, by Division 33, Section “Sub-drainage”.

B. Base Materials by Division 31, Section “Earthwork”

C. Materials: All components and their installation method shall be designed and manufactured for use on outdoor athletic fields. The materials as hereinafter specified, should be able to withstand full climatic exposure in the area of the Project, be resistant to insect infestation, rot, fungus, and mildew; to ultra-violet light and heat degradation, and shall have the basic characteristic of flow-through drainage allowing free movement of surface run-off through turf where such water may flow to the sub-base and into the field drainage system.

D. Synthetic Turf System:
   1. Football & Soccer field (Basis of Design):
      a. Provide attic stock as describe within the ‘Warranties’ subsection.
      b. The synthetic turf surface should provide the performance characteristics, components and construction that meet the needs of the declared use for the playing field.
      c. Synthetic turf construction should provide a system that is resistant to weather, rot, mildew and fungus growth. The system components should be non-toxic, not cause commonly known allergic reactions, and conform to environmental requirements. Each synthetic turf system should be constructed to provide dimensional stability and resist damage from wear and tear during athletic and recreational usage. Each system should be resistant in it’s entirely to excessive ultraviolet degradation.
      d. Fibers for Tufted Systems: The polypropylene or polyethylene fiber should be of flat film, extruded or texturized slit film for football field.
      e. Primary Backing Systems: The primary backing materials should be either polyester tire cord, utilized in the knitting process, or a woven, non-woven, or other suitable materials in one or more layers, utilized in the tufting process.
      f. Secondary Backing Systems: The secondary backing materials should be applied through a coating process that can be single or multiple applications of one or several different materials. A knitted turf fabric should receive an initial acrylic coating followed by different options of polyurethane or suitable latex coatings in various weights and thickness configurations, depending on individual system design. A tufted turf fabric should receive a polyurethane or suitable latex pre-coat or a performance-based acceptable equal which than can be followed by an attached cushion or a laminated secondary backing utilizing polyurethane, suitable latex, or an acceptable performance-based equal. The purpose of the secondary

backing is to provide the desired level of tuft bind and structural integrity of the turf components. In cases where an increased level of system resilience is desired, multiple layers of secondary backing materials of different physical characteristics can be applied.

g. Water Permeability Rate: Permeable system by design with adequate drainage, perforations should be put through all of the backing coatings to provide for adequate drainage through the system as specified.

h. Seams: New synthetic turf materials are manufactured in panels or rolls that are usually 15 feet wide. Each panel or roll should be attached to the next with a seam to form the fabric of the field. Seams should be glued with a supplemental backing material or sewn with high strength sewing thread.

i. Adhesive: All adhesives used in bonding the system together should be resistant to moisture, bacterial and fungus attacks, meet local/regional environmental requirements and be resistant to ultraviolet rays at all locations within the installed system. The bonding or fastening of all system material components should provide a permanent, tight, secure, and hazard-free, athletic playing surface.

j. Seaming Tape: Seaming tape is commonly used for seams and/or inlaid lines and markings. The tape is comprised of a fabric that should be installed below the backing material on both sides of a seam or inlay. Adhesive is then applied to the seaming tape to provide a bond between adjacent turf panels to sections. The fabric used for seaming tape should provide dimensional strength and enough surface texture to bond well with the adhesive.

k. Turf Characteristics:
   1) Fiber Type: Slit Film
   2) Yarn: UV-Resistant Polyethylene
   3) Turf Bind Strength: 8-10 lbs/force
   4) Face/Pile Yarn Weight: minimum of 48 oz/sq yd.
   5) Total Weight: minimum of 72 oz.
   6) GMax Range: 130-165
   7) Base Bid: Infill materials without shock pad: Sand 70% and Rubber 30%
   8) Pile Height:
   9) Base Bid: 2 inch without shock pad
   10) Colors: Five minimum, manufacturer's standard colors – light green, dark green, blue, yellow, gray, white, and black. Custom colors as required to match school colors for end zones, team areas, out of bounds etc. – see plans.

E. Infill Material: Infill materials are comprised of rubber and sand, thereof which are placed on top of the synthetic turf backing and between the synthetic surface fibers.
   1. Sand: The sand material utilized as infill should be silt free, similarly sized, and rounded to sub-angular. The sand should be delivered to the site graded, washed and dried.
   2. Rubber: The rubber infill utilizes material that is either styrene butadiene rubber (SBR) or ethylene propylene dien polimerisat (EPDM) rubber granules. Both ambient and/or cryogenic rubber can be used. Rubber granules must be clean and free of all metal/ferrous materials
   3. Hybrid: Constitutes the use of sand and rubber or other suitable materials in various combinations.

F. Lines, Markings, Logos or text: Construction and materials used should be harmonious with the synthetic surface.
   1. Installation: Lines, markings, logos or text shall be inlaid in the synthetic turf surface. Paint shall not be used unless otherwise approved by A/E.
   2. Color of inlaid lines, markings logos or text fabric shall be in colors as selected by the Owner / Architect from custom color selections, to match school colors. Any colors selected from custom colors shall be supplied at no additional cost to the owner.
      a. Refer to Drawings for field markings, lines, graphics, text and colors.
   3. Consistency: Synthetic turf and fibers utilized for the tufted or inlaid lines, markings, logos or text should be similar to that used in all other areas of the field and installed to the same tolerances.

G. Inserts: Covers for goal sleeves and anchors to synthetic turf.

1. Consistency: The synthetic turf used for the inserts should be similar to that used in the area adjacent to the insert.
2. Installation: The inserts should be anchored securely to the surrounding areas so that they cannot be displaced by the activities occurring on the field and installed to the same tolerances.

H. Nailer Strip: New Installation - The nailer strip shall be 2 inch by 4 inch treated “for ground contact” Southern Pine.

I. The entire synthetic turf system shall be “lead-free”.

J. FieldSpec 7’ Drag Brush:
1. Basis of Design: Field Spec 7’ Drag Bush and Accessories as manufactured and/or supplied by:
   a. Sportsfield Specialties, Inc.; P.O. Box 231, 41155 State Highway 10 Delhi, NY 13753, P. (888) 975-3343
2. System to Include:
   a. Powder coated steel construction
   b. Towable with small tractor or utility vehicle
   c. Reversible & replaceable grooming brushes
   d. Replaceable dethatching tines
   e. Simplified height adjustment
   f. Easily upgradable to 15’ brush
   g. Fully portable for off-field storage
   h. Approx. unit weight: 20 lbs.

K. FTMAG – 7’ Tow Behind Magnet:
1. Basis of Design: FTMAG – 7’ Tow Behing Magnet and Accessories as Manufactured and/or Supplied by:
   a. Sportsfield Specialties, Inc.; P.S. Box 231, 41155 State Highway 10 Delhi, NY 13753, P. (888) 975 – 3343
2. System to Include:
   a. Tow behind magnet system for system for synthetic infill turf
   b. Pull handles allow debris to be released from magnet
   c. Powder coated steel and aluminum construction
   d. Compatible with SweepRight Pro and GroomRight
   e. Approximate unit weight: 150lbs.
   f. Store inside when not in use

2.3 Synthetic Turf Underdrainage System

A. Furnish geo-textile covered perforated flat panel drains with all end caps, adapters, transitions and fittings required for a complete system.

B. Approved manufacturers:
1. Hydraway, (800) 223-7015; 12” Hydraway 2000
2. Advanced Drainage Systems, (800) 821-6710; Model AdvanEdge 12” (if available)
3. Varicore Technologies, Inc., (800) 978-8007; Multi-Flow 12”
4. JDR Enterprises, Inc., (800) 843-7569; J-Drain MVP 12”

C. Collector Drains: Utilize G-Series Plans. Include all associated fittings, transitions, end caps, adapters, couplers, outlets, and connectors.

D. Concrete Curb and Perimeter Nailer:
1. Curb: 3,500 PSI, minimum
2. Nailer: 2x4 composite wood or Treated wood nailers appropriate for this application, fastened with tapcon or ramset every 24” on center.

2.4 Aggregate: A1 Stone Drainage Layer – Submit laboratory test providing a complete breakdown of the material and permeability prior to starting work.

A. Sieve Size : Percent Passing
   1. 1 ½" – 100%
   2. 1" – 95-100%
   3. ¾" – 80-100%
   4. ½" – 60-80%
   5. 3/8" – 30-50%
   6. #4 – 20-40%
   7. #8 – 10-30%
   8. #16 – 7-25%
   9. #40 – 5-17%
   10. #200 – 0-4%

2.5 Aggregate: A2 Washed Stone Chocker Layer – Minor adjustments to aggregate blends may be approved by the Owner with prudent testing data to support the deviation. Permeability must be greater than 16" per hour for the finished synthetic system. Submit laboratory test providing a complete breakdown of the material and permeability prior to starting the work.

A. Sieve Size : Percent Passing
   1. ½" – 100%
   2. 3/8" – 95-100%
   3. #4 – 70-85%
   4. #8 – 45-60%
   5. #16 – 25-40%
   6. #40 – 2-12%
   7. #200 – 0-3%

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspection: Synthetic materials should be inspected prior to installation for:
   1. Damaged or defective goods.
   2. Missing goods or quantities.
   3. Correct turf pile height.
   4. Correct backing perforation diameter and spacing if applicable.
   5. Materials out of tolerance with the specification.

3.2 GENERAL, INSTALLATION

A. The installation shall be performed in full compliance with shop drawings and manufacturer's printed instructions.

B. All installation operations shall be performed by personnel directly employed by the manufacturer, fully familiar with the materials and their application, under the full time direction and supervision of a qualified technical supervisor employed by the manufacturer of the synthetic turf.

3.3 INSTALLATION

A. Subgrade Preparation, refer to Division 31, Section "Earthwork": The subgrade should provide a stabilized foundation upon which base materials and subsequent components of playing field systems will be installed.
   1. Subgrade (Rough) Planarity: The tolerances for the finished subgrade should not exceed one inch as measured by a 10 foot straight edge. Grading of the subgrade shall minimize ponding to the extent practical.

B. Aggregate refer to Division 31, "Earthwork": Installation of the aggregate base should provide a close, evenly textured surface meeting the required tolerances.

C. Nailer: Attach the treated nailer for the turf attachment to the trench drain footing and curbs by means of a galvanized 3/8 inch minimum bolt at 4 feet on center, minimum. The elevation of the nailer shall be determined by the turf manufacturer's specifications.

D. Synthetic Turf Installation: All synthetic turf systems should be installed to provide stability that will prevent panels from shifting or bunching.
   1. Seaming Method: The synthetic turf panels should be securely fastened together for the warranted life of the system. These seams are typically glued or sewn, the method for which varies from system to system. Seam gaps should be uniform. For tufted infill systems the gap between the fibers should not exceed the gauge of the tufting. For other synthetic turf systems, the seam gaps should not exceed 1/16 inch.
      a. Major panel seaming: Seams must be sewn. Seams shall be flat, tight and permanent with no separation or fraying.
      b. Inlays shall be glued and warranted for workmanship per the Warranty Article.
   2. Edge Anchoring: Tie anchor to trench drain. Provide a secure anchor.

E. Infill Material Installation: Correct installation is critical to performance of these systems and should follow the manufacturer's recommendations.
   1. Environmental Conditions: It is recommended infill materials should be installed under dry field conditions.
   2. Method of Application: The infill material should be installed uniformly. The equipment used for the application of the infill materials should erect the fiber, place the infill materials, and should incorporate a metering method to provide consistent distribution. The equipment utilized should not distort or displace any base materials or damage to system in any way.
      a. Apply infill in numerous thin lifts using specialized broadcasting equipment
      b. Infill material shall be installed to a depth of approximately 1.75 inches. A maximum of 0.75 inches of fiber can be exposed
      c. Infill mixture can only be applied when dry

F. Fiber Conditioning: It is essential to maintain the integrity and uniformity of the fiber throughout the manufacturing, shipping and handling, installation and maintenance processes in order to prevent damage which could alter the specified performance and void the warranty.

3.4 FIELD MARKINGS

A. Installer shall install logos, numbers and additional markings as indicated in accordance with process indicated on shop drawings.

3.5 CLEANUP

A. Contractor shall provide the labor, supplies and equipment as necessary for final cleaning of surfaces and installed items.

B. All useable remnants of new material shall become the property of the Owner.

C. The Contractor shall keep the area clean throughout the project and clear of debris.

D. Surfaces, recesses, enclosures, etc. shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing agency to perform field quality-control testing.

B. G-Max Testing, ASTM F1936:
   1. Temperature: Ambient shaded air temperature of 40 – 100 degrees Fahrenheit.

2. Number: 10 tests shall be conducts throughout each field area at completion of work. Test locations shall conform as closely as possible to the test sites specified in ASTM F1936 (Football) or FIFA Handbook 3-06 (Soccer).
    a. Provide complete report of testing values and diagram of locations.
    b. Acceptable industry manufacturer tolerance of +/- 2 percent.
    c. Test results shall be between 130 and 175. If test results in values above 175, adjustments should be made to the installation and materials until test results are within the acceptable range.

3.7 DEMONSTRATION

A. The synthetic turf installer shall provide detailed written maintenance instructions, suggested guidelines for the system, and training of maintenance personnel. Maintenance of the systems typically consists of cleaning, stain removal, minor seam repair, dragging or redistribution of any infill material, and management of infill compaction. Specialized equipment is typically required for the maintenance of the surface and should be included with the field contract. Utilizing this equipment as recommended by the installation builder will generate the proper maintenance in relation to any future warranty claims.

3.8 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable infill, obstructions, demolished materials, and all waste materials including trash and debris, and legally dispose of them off Owner's property.
    1. Burning of combustibles, cleared and grubbed materials is not permitted on Owner's property

3.9 MANUFACTURER / PRODUCT INFORMATION REQUIREMENTS

A. Manufacturer product characteristics and specifications shall be submitted for consideration by each contractor following bidding for consideration

END OF SECTION 321813

SECTION 321824-RUNNING TRACK SURFACE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section as though bound herein.

1.02 SUMMARY

A. Section Includes: Synthetic surfacing work includes, but is not limited to, the following:
   1. Latex Synthetic surfacing of running track and field event areas as base bid
   2. Painting of lines and numerals.

B. Related Sections:
   1. Excavation, filling, grading, and compaction of subgrade under running track and field event areas is included under the Work of Section 312000
   2. Bituminous asphalt binder**/**surface course and subbase for running track and field event areas is included under the Work of Section 321216
   3. Concrete base for field events and related concrete work. Refer to Section 321313.

C. Refer to Alternates that may affect the Work of this Section.

1.03 REFERENCES

A. USA Track and Field (USATF)
B. National Federation of State High School Associations (NFHS)
C. American Sports Builders Association (ASBA)

1.04 SUBMITTALS

A. Layouts for Running Track (Metric) and Field Events
   1. Submit Drawings to show the tracks and field event layouts, including metric lane markings, passing zones, start and finish lines, and other markings required in accordance with NFSHSA. These Drawings shall be reviewed by the Architect; then will be sent to the Owner for his comments and approval.
   2. The layout of the track and field events shall conform with the Drawings. Marking paint colors by NFSHSA recommendations.

B. Samples for Initial Selection: Submit one sample, not less than 3 by 3 inch for the surface being provided.

C. Quality Assurance/Control Submittals
   1. Product Data: Submit copies of manufacturer's specifications and installation instructions for items required. Include data substantiating that materials comply with specified requirements. Indicate that Installer has received copy of manufacturer's instructions.
   2. Qualification Data: For installers, including Authorized Applicator certificate from the surface system manufacturer.
   3. Contractor is to provide certified statement in writing from Manufacturer listing the overall quantity of rubber (total pounds of granules or strands) and tack coat/primer; and latex binder (total gallons) to be delivered to the job site and used in this track resurfacing project. At the start of construction the contractor shall submit delivery tickets and a Copy of shipping invoices of all materials shipped to the site and used on the project. These documents will be submitted to the Architect prior to final payment.
   4. A certificate from the manufacturer of the binders and coatings stating that the materials have been produced specifically for the use in sports surfacing construction.

D. Closeout Submittals
   1. Provide Owner with written instructions for track use and maintenance requirements in accordance with the warranty.
   2. Upon completion of striping and layout work, the Contractor shall submit to the Architect an "As Built Drawing" prepared by a licensed surveyor certifying that all points and layouts shown on the approved shop drawing are located where required. A letter shall be included attesting to the accuracy of the track markings and measurements. This Drawing shall show the surveyor's name, address, stamp and surveyor's license number. The cost of this Work shall be included in the Contractor's bid.

1.05 QUALITY ASSURANCE

A. Installation of synthetic surfacing must be performed by a Contractor who has minimum of 5 years experience in the field and can demonstrate successful completion of similar projects.

B. A representative of the manufacturer of the synthetic material shall be at the job site during performance of the Work to assist and advise the asphalt plant in establishing the proper mix and to assist and advise the Contractor on all phases of the synthetic surfacing installation.

C. The Contractor shall record batch number of each product used on the site and maintain it throughout the warranty period.

D. The Contractor shall provide the volume of each liquid product and the weight of the rubber granule to be used on site.

E. Installer and Manufacturer shall be a member of the ASBA.

F. Pre-Installation Meeting: Schedule a pre-installation meeting through Construction Manager to review the sub-base material, synthetic surface materials delivered to the project site, testing and quality assurance required by the Specifications and general installation and completion process.

G. Prior to application of the UV protective coatings and line marking, the surface shall be tested for the required depth using SMG FT-3 Floor tester depth gauge. The running track oval shall be tested in no less that 100 locations. The tests shall be performed at the center of both the outer and inner lane, as well as, the center of the oval. If at least 80% of the readings do not meet the required depth, additional layers of rubber and binder will be applied until the proper depth has been achieved.

1.06 WARRANTY

A. The installer and materials manufacturer shall supply a warranty covering labor and materials respectively covering the work of this Section, including delamination, discoloration and material failure.
   1. Warranty Period: Five years from the date of Substantial Completion.

B. Special Project Warranty: Warranty form at the end of this section, signed by installer, covering the work of this section, including delamination, discoloration, and material failure.

PART 2 PRODUCTS

2.01 MANUFACTURES

A. Base bid Latex Surface Manufacturers: Subject to compliance with requirements, provide products for Latex surface by one of the following:
   1. Maxflex BL; Precision Sports Surfaces, Inc., Charlottesville, Virginia.
   2. Reflex-1; Goddard Coatings Company, Auburn Hills, Michigan.
   3. Top Trax Surfacing System; All American Tracks Corporation, Amherst, Ohio.
   4. Seal Flex; Current Surfaces, Hanover, Michigan.
   5. Resilo-Flex; Site Technology, Inc., Stow, Ohio.
   6. Speedflex L400; Reece Seal Coatings, Inc., Indianapolis, Indiana.
   7. Plexitrac, California Products Corp.

B. Products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product. Requests for Architect/Engineer's approval must be accompanied by the "Substitution Request Form" and complete technical data for evaluation. All materials for evaluation must be received by the Project Manager and Specification Department at least 10 days prior to bid due date. Additional approved manufacturers will be issued by Addendum.

2.02 MATERIALS

A. General: Shall conform to manufacturer's current specification. The surfacing system shall be complete and consist of components, blended and mixed in the prescribed manner, placed and installed with the recommended equipment to provide the best finished product available from the manufacturer.

B. Description of Base Bid Latex System
   1. 3/8 inch thick minimum depth.
   2. Color: Black.
   3. Installation includes:
      a. One tack coat of latex binder or asphalt emulsion.
      b. Minimum 4 layers of SBR rubber granules rubber bound with latex binder.
      c. "Overspray" top layer of latex binder.

C. Product Description Base Bid Latex System
   1. Binder/primer
      a. Latex binder: Provide type of latex binder as recommended by the manufacturer.
      b. System (rates given are minimum - follow manufacturers recommendations if more binder is required.)
         1) Tack coat/primer is to be installed at a minimum rate of .05 gal./sq.yd.
         2) Over first layer of rubber, install one of the following at a rate of .07 gal./lb. of rubber in a sq.yd.
         3) Over remaining layers of rubber granules, install one of the following at a rate of .07 gal./lb. of rubber in a sq.yd.
            a) Provide a U.V. inhibitor in top layer.
         4) "Overspray" layer is to be at a rate of .1 gal. per sq.yd. Provide SBR Latex Binder with U.V. inhibitors or acrylic latex binder.
         5) Overall minimum quantity of binder is to be as follows: (.73 gal./sq.yd.)

c. Note: The overall quantities listed are to be used for the purpose of setting a minimum acceptable quantity to be used in the Project and noted in the certification statement to be signed by the Contractor. The Contractor is responsible for estimating total quantities of latex binder as required for a complete installation and to provide total encapsulation of rubber particles to provide a **minimum** 3/8 inch depth overall. The total quantity of materials should be based on each manufacturers recommended rates. The rates may exceed the minimum amount listed above to comply with the Manufacturers synthetic surfacing system. The Contractor is responsible to field verify all quantities. The Owner will not be responsible for additional expenses for provision of additional materials beyond the quantities listed above.

2. Rubber

a. Minimum pounds per sq.yd.: 9.5 pounds overall. Provide one of the following systems or combination of strand and granule to achieve overall minimum 3/8 inch depth and minimum 9.5 lb. rubber/sy.

b. Size of rubber:

1) Granules

a) 1-3 mm on bottom 3 layers

b) .5-1.5 mm on top layer

Sieve	% Retained
3 Mesh	- 0
1/4"	Trace
8 Mesh	35 – 45
16 Mesh	50 – 95
20 Mesh	75 – 100
30 Mesh	95 – 100

c) Medium (middle 2 layers):

Mesh	Minimum	Maximum	Opening
1/4 inch	-	0	.250
8	5	30	.0937
16	50	90	.0469
20	75	100	.0331
30	98	100	.0234

d) Fine (top layer):

Mesh	Minimum	Maximum	Opening
10	0	5	.0787
16	50	70	.0469
30	70	97	.0234
Pan	0	3	Pan

2) Note: The overall quantities listed are to be used for the purpose of setting a minimum acceptable quantity to be used in the Project and noted in the certification statement to be signed by the Contractor. The Contractor is responsible for estimating total quantities of rubber as required for a complete installation at a 3/8 inch depth. The total quantity of materials should be based on each manufacturers recommended rates. The rates may exceed the minimum amount listed above, to comply with the Manufacturers synthetic surfacing system. The Contractor is responsible to field verify all quantities. The Owner will not be responsible for additional expenses for provision of additional materials beyond the quantities listed above.

D. Line Marking Paint: Shall be 100 percent acrylic latex type, unless different type is recommended by surfacing manufacturer. The use of traffic, oil, alkyd, or solvent-vehicle type paints is prohibited.

PART 3 EXECUTION

3.01 INSTALLATION OF SYNTHETIC SURFACING

A. Before the surfacing is applied, the running track and field events surface shall be cleaned of dirt and debris. Prepare surface by applying primer.

B. Strictly adhere to manufacturer's written instructions for mixing, transporting, spreading, and compacting resilient material.

C. Utilize only installation equipment and procedures that are recommended by surfacing manufacturer.

D. Do not begin track and field events work before completion of final grading and surfacing.

E. Construction involving track materials shall not be conducted during a rainfall, and when rainfall is imminent. Both ambient and materials temperatures are to be at least 50 degrees F. (10 degrees C.) and rising.

F. After a rainfall, sufficient time shall be given to allow the surface to dry before resuming work. Surface shall be dry, as well as clean, since moisture on the surface on hot days can turn to steam or vapor. If moisture is trapped under an application of material, blisters may occur.

3.02 INSTALLATION OF SYNTHETIC SURFACING ON CONCRETE BASE

A. Allow minimum cure time of 28 days or as determined by each manufacturer prior to installation of primer and synthetic surfacing.

B. Power wash concrete surface and allow to dry completely prior to installation of primer.

C. Use primers as acceptable for each manufacturers product. Do not use asphalt emulsion as binder or primer over concrete base.

D. Apply tack coat, binder, granule layers and additional binder as required by manufacturer’s installation instructions to achieve thickness specified.

3.03 INSTALLATION OF SYNTHETIC SURFACING ON ASPHALT PAVEMENT

A. Allow minimum cure time as recommended by manufacturer prior to installation of primer and synthetic surface over new asphalt pavement.

B. Prior to application of resilient surface materials, the entire surface shall be flooded and checked for depressions or irregularities in the asphalt in the presence of the Contractor installing the Asphalt. Any puddle area covering the nickel shall be marked for repair. Asphalt shall not vary more than 1/4 inch in 10 feet, measured in any direction. Any depressions 1/4 inch or greater shall be leveled using appropriate patch materials as recommended by synthetic surface manufacturer.

C. Apply tack coat, binder, EPDM granule layers and additional binder as required by manufacturer’s installation instructions to achieve thickness specified.
   1. Each layer shall be checked to ensure thickness and density uniformity.
   2. Binder shall be applied to fully encapsulate granules.

D. Prior to application of the UV protective coatings and line marking, the surface shall be tested for the required depth using SMG FT-3 Floor tester depth gauge. The running track oval shall be tested in no less that 100 locations. The tests shall be performed at the center of both the outer and inner lane, as well as, the center of the oval. If at least 80% of the readings do not meet the required depth, additional layers of rubber and binder will be applied until the proper depth has been achieved.

E. Apply final UV protective coating in two applications. One application shall be applied clockwise and the other counterclockwise.

3.04 LINE MARKING OF RUNNING TRACK AND FIELD EVENTS

A. Striping shall be carefully completed so lines are uniformly applied, straight, and with even edges. Colors shall be as shown on the Drawings as selected by the Architect.

B. Lines and other markings shall receive 2 coats of paint, amount as recommended by the manufacturer. Paints shall be used directly from original containers and absolutely no thinning shall be allowed.

C. Wait 48 hours after surface competition before applying line marking. The installer shall:

1. Establish and set all necessary control points.
2. Layout all lines and markings to tolerances set forth by governing body requirements.
3. Prepare all necessary drawings..
4. Provide all computations and measurements in organized form.
5. Establish all location on the curves using a transit or theodolite capable of reading direct to 20 seconds.
6. Identify all markings, where appropriate, by painting the identification directly onto the track surface in 4 inch letters below or in front of each mark on the right hand portion of the lane
7. Paint all of the large, 3 foot high, lane numbers in two colors, utilizing shadowed backgrounds.
8. All lines shall receive sufficient paint to assure complete opacity and uniformity of color.
9. Amount of paint used shall be as recommended by the manufacturer.
10. The paint used shall be a 100 percent acrylic latex line paint made especially for the painting of lines on sports surfaces.
11. All measurements shall be made by a competent, experienced, and fully qualified personnel.
12. The markings shall include all events and marks required or recommended by the National Federation of State High Schools, the NCAA, or the IAAF dependent on the end use of the facility.

3.05 PROTECTION

A. During construction, limit access of non-construction personnel to the site.

B. Coordinate other construction with the installation contractor.

C. The installer shall protect curbs, fences, and all other surfaces and structures from overspray.

3.06 CLEAN UP

A. Remove all containers, surplus and debris. And dispose of in accordance with local, state, and federal regulations.

B. Remove all spills and overruns and clean any spray drift from adjacent surfaces or improvements.

C. Leave site in a clean and orderly condition.

3.07 FIELD QUALITY CONTROL

A. The Owner shall reserve the right to request a representative sample of the synthetic track surface be analyzed by an independent testing laboratory prior to final completion. The testing would verify the chemical composition, thickness and compliance with the project and manufacturers specification. The cost of one test for samples indicated below shall be included in the Contractors bid.

B. The finished track surface shall be tested for compliance with the above specifications. The following method shall be employed:
   1. Three 6 by 6 inch test cuts shall be cut out of the finished track surface by the Contractor, in the presence of the Owner.
   2. The location of the test cuts shall be selected by the Owner and shall be located not less than 6 inches from the edge of the surface.
   3. The test cuts shall be examined for thickness and weight by an independent testing laboratory. The finished weight of the base bid Latex system shall be not less than 11.5 pounds per square yard of surface. Thickness shall be 3/8 inch. In the event that the above minimums are not achieved, the Contractor shall install additional materials until said minimums are achieved. The Contractor shall repair the areas where the test cuts were made to match the surrounding track area to a like new condition.

3.08 INSTALLERS WARRANTY

1 WHEREAS, _____ of _____ _____herein called "Surfacing Installer," has preformed surface coating and associated work ("work") on the following project:

a Owner: _____ _____

b Address: _____ _____

c Building Name: _____ _____

d Address: _____ _____

e Acceptance Date: _____ _____

f Warranty Period:_____ _____

g Expiration Date: _____ _____

2 AND WHEREAS, Surfacing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against delamination, discoloration, material failure, defective materials and workmanship for a designated warranty period of 5 years from date of substantial completion.

3 NOW THEREFORE, Surfacing Installer hereby warrants, subject to terms and conditions herein set forth, that during warranty period he/she will, at his/her own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as necessary to maintain said work in same condition as at "Acceptable Date".

4 Within Warranty period, Installer or Manufacturer shall make periodic visits after the seasons of use or prior to the season of use to observe the track surface and notify the Owner of any areas needed preventive maintenance. If areas show the affects of poor materials or workmanship they should be corrected as part of this Warranty.

5 This warranty is made subject to the following terms and conditions:

a Specially excluded from this warranty are damages to work cause by:

1 Acts of vandalism

2 Failure of substrate, including settlement.

b When work has been damaged by any of foregoing causes, warranty shall be null and void only in affected are until such damage can be repaired and until cost and expense there of have been paid by Owner or by another responsible party so designated.

c Surfacing Installer is responsible for damage to work covered by this warranty but is not liable for consequential damages that may result from faults or defects of work.

d During warranty period, if Owner allows alteration of work by anyone other than Surfacing Installer, including cutting, patching and maintenance in connection to additional penetrations, this warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this warranty. If Owner engages surfacing installer to perform said alterations, warranty shall not become null and void unless Surfacing Installer, before starting work, shall have notified Owner in writing, showing reasonable cause for claim, that said

alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this warranty.

e During warranty period, if original use of surface is changed and it becomes used for, but was not originally specified for a skateboard area, or other use or service more severe than originally specified, this warranty shall become null and void on date of said change, but only to extent said change affects work covered by this warranty.

f Owner shall notify Surface Installer of observed, defects or deterioration and shall afford reasonable opportunity for Surface Installer to inspect work and to examine evidence of defects and deterioration.

g This warranty is recognized to be the only warranty of Surface Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of surface failure. Specifically, this warranty shall not operate to relieve Surface Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

6 IN WITNESS THEREOF, this instrument has been duly executed this _____ _____ day of _____, _____ _____.

a Authorized Signature: _____ _____

b Name: _____ _____

c Title: _____ _____

END OF SECTION 321824