



ADDENDUM

01

Cape Henlopen School District
Synthetic Turf Replacement

Date of Addendum: July 15, 2020

1250 Kings Highway, Lewes, DE 19958

ELA Sport Project No.: AZ236-001

The original Project Manuals and Drawings dated June 22, 2020 for the project noted above, are amended as noted in this Addendum No. 01.

Receipt of this Addendum shall be acknowledged by inserting its number and date in the space provided on the Bid Form.

This Addendum consists of 4 Pages and all attachments listed.

SPECIFICATIONS

01.01 Revised Document 00200 Instructions to Bidders as follows:

1. Added Paragraph 4.1.13 addressing the newly enacted Craft Training requirements:

4.1.13 *Each Bidder shall include a Signed Affidavit for the Bidder certifying compliance with Craft Training standards set forth in Title 29, Chapter 69, Section 6962(d)(13) of the Delaware Code, which states contractors and subcontractors must provide craft training for journeyman and apprentice levels for crafts listed at the Delaware Department of Labor at the following link:*
<https://det.delawareworks.com/documents/Apprenticeship/Apprenticeship%20occupation%20s.pdP20190215>

01.02 Revised Document 00410 Bid Form as follows:

1. Added lines to itemize the cost of the minimum required imported SBR rubber as required by Specification Section 329200 "Synthetic Turf Surfacing"
2. Added Alternates 2, 3 and 3A (See 1.03 below).
3. Revised Unit Pricing to clarify UP-1 to 20' High Ball Barrier Netting.
4. Revised Unit Pricing adding UP-3: 15' High Ball Barrier Netting.
5. Added "Affidavit of Craft Training Compliance" to Bid Form

01.03 Revised Section 012200 "Unit Prices" as follows:

1. Section 3.1.1: Clarified the Ball Barrier netting to be 20' high.
2. Added Section 3.1.3 Unit Price UP-3 15' High Ball Barrier Netting System.

01.04 Revised Section 012300 "Alternates" as follows:

1. Added Section 1.4.B - Alternate 2 which includes the following:

Alternate 2: Due to COVID-19 pandemic, and the possibility that the fall sports season could be subject to cancellation after the submission of the bid, the current project schedule may be allowed to be revised to reflect a later start of the project. To accommodate the possibility of this occurring the Owner requests an alternate cost be provided to furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract Documents for all work associated with the installation replacement synthetic turf and installation of the new ball barrier netting system agreed to under the contract commencing site work after September 4, 2020 with substantial completion no more than four (4) weeks later than the start of site work and final completion no later than five (5) weeks after the start of site work. Final completion shall be on or before December 23, 2020.

2. Added Section 1.4.C - Alternate 3 which includes the following:

Alternate 3: Furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract Documents for all work associated with the installation a 15' high new ball barrier netting system in lieu of the 20' high ball barrier system required in the base bid.

3. Added Section 1.4.D - Alternate 3A which includes the following:

Alternate 3A: Furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract Documents for all work associated with the installation a 15' high new ball barrier netting system in lieu of the 20' high system from both ends of the field up to the 10 yard line on the football field. Price shall include all four (4) corners of the field.

01.05 Revised Section 329200 "Synthetic Turf Surfacing" as follows:

1. Revised Section 1.8.A.3:

3. Number of fields of equal or similar construction to that as the manufacturer offered product installed in the continental United States in ***2007 the last 10 years and earlier*** with not less than three (3) having been installed within approximately 200 miles of the project site. Installation list shall include facility name, product installed, substantial completion date, and location/address.

(Addendum No. 1):

2. Added Sections 2.2. F and 2.2.G:

F. Bidders shall include in their costs the recycling of the existing rubber / sand infill for re-use in the new turf system.

G. Bidders shall include in their costs a minimum of 80,000 lbs. of new SBR rubber to supplement the recycled infill to achieve the required 6 lbs. / SF infill weight. The price should be identified in the space provided on the Bid Form.

(Addendum No. 1)

3. Added Sections 2.3.A.6 through 2.3.A.8:

6. Base Bid E – Manufacturer: Shaw

ASTM Standard	Specification	Field Requirement
	Yarn Structure	Slit Film
D1577	Fiber Denier	9000 min.
D418/D5848	Pile Height (inches)	2.25" min.
D418/D5848	Min. Pile Weight (oz / sq. yd.)	48
D1335	Tuft Bind (W/ Infill) (lbs. force)	10 lbs. min.
D1682/D5034	Grab Tear (Width) (lbs. force)	200 min.
D1682/D5034	Grab Tear (Length) (lbs. force)	200 min.
D4491/DIN18-035	Carpet Permeability (inch/hour)	25 min.
F1936	Impact Attenuation (Gmax)	<125 installed <200 warranty
	Minimum Infill Weight (lbs./SF)	6.0 min

(Addendum No. 1)

7. Base Bid E – Manufacturer: Hellas Construction

ASTM Standard	Specification	Field Requirement
	Yarn Structure	Slit Film
D1577	Fiber Denier	10750 min.
D418/D5848	Pile Height (inches)	2.25" min.
D418/D5848	Min. Pile Weight (oz / sq. yd.)	48
D1335	Tuft Bind (W/ Infill) (lbs. force)	10 lbs. min.
D1682/D5034	Grab Tear (Width) (lbs. force)	300 min.
D1682/D5034	Grab Tear (Length) (lbs. force)	300 min.
D4491/DIN18-035	Carpet Permeability (inch/hour)	40 min.
F1936	Impact Attenuation (Gmax)	<130 installed <190 warranty
	Minimum Infill Weight (lbs./SF)	6.0 min

(Addendum No. 1)

8. Base Bid E – Manufacturer: Act Global

ASTM Standard	Specification	Field Requirement
	Yarn Structure	Slit Film
D1577	Fiber Denier	10000 min.
D418/D5848	Pile Height (inches)	2.25" min.

D418/D5848	Min. Pile Weight (oz / sq. yd.)	48
D1335	Tuft Bind (W/ Infill) (lbs. force)	8 lbs. min.
D1682/D5034	Grab Tear (Width) (lbs. force)	200 min.
D1682/D5034	Grab Tear (Length) (lbs. force)	200 min.
D4491/DIN18-035	Carpet Permeability (inch/hour)	40 min.
F1936	Impact Attenuation (Gmax)	<125 installed <200 warranty
	Minimum Infill Weight (lbs./SF)	6.0 min

(Addendum No. 1)

ATHLETIC FACILITY DRAWINGS:

01.06 Revised Drawing C1.0 as follows:

1. Added notes for Alternates 2, 3 and 3A.
2. Revised Unit Price 1 to indicate 20' High Ball Barrier System.
3. Added Unit Price 3 (UP-3) indicating price for a 15' High Ball Barrier System.

01.07 Revised Drawing C1.2 as follows:

1. Revised Ball Barrier note indicating 20' High Ball Barrier system is base bid.
2. Added reference to Alternate 3 and 3A.
3. Revised Ball Barrier Netting detail to reflect the two different net systems

END OF DOCUMENT

DOCUMENT 00410 – BID FORM

TO: CAPE HENLOPEN SCHOOL DISTRICT
c/o Mr. Lenny Richardson
1270 Kings Highway
Lewes, Delaware 19958

BIDS DUE: 3:00 PM, Prevailing Time
July 22, 2020

(Addendum No. 1)

RE: **CAPE HENLOPEN SCHOOL DISTRICT
SYNTHETIC TURF REPLACEMENT**

NAME OF BIDDER: _____

Phone. No.: _____

Fax No.: _____

Delaware Business License No.: _____

(Note: A copy of Bidder's Delaware Business License must be attached to this form.)

Taxpayer ID No.: _____

Other License Nos.: _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance herewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

TOTAL BASE BID PRICE IN FIGURES \$ _____

TOTAL BASE BID PRICE IN WORDS _____

_____ Dollars

Total Price of Imported SBR Rubber Included in the Base Bid Price above in Figures
\$ _____

DOCUMENT 00410 – BID FORM

Total Price of Imported SBR Rubber Included in the Base Bid Price above in Words _____

Dollars

ALLOWANCES

NONE

Accompanying this proposal is the bid security in the form of

In the amount of _____ Dollars

(\$ _____)

ALTERNATES

Contractor(s) are required to bid alternate prices on the following items.

The undersigned proposes the following alternates to the Basic Proposal in accordance with the Description set forth below in Section 001230 - Alternates, and respective Specification Sections.

All line items to be completed indicating amount to be added to or deducted from the base bid, N.C. (indicating no change in the dollar amount), or N.A. (Not applicable).

Alternate No. 1: State the amount to be added / deducted to the Base Bid to furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract Documents for all work associated with the installation new ball barrier netting system from the base bid net system at the both ends of the field up to the 10 yard line on the football field.

Add / Deduct \$ _____
(Circle One) (Amount)

Dollars

Alternate No. 2 : *Due to COVID-19 pandemic, and the possibility that the fall sports season could be subject to cancellation after the submission of the bid, the current project schedule may be allowed to be revised to reflect a later start of the project. To accommodate the possibility of this occurring the Owner requests an alternate cost be provided to furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract Documents for all work associated with the installation replacement synthetic turf and installation of the new ball barrier netting system agreed to under the contract commencing site work after September 4, 2020 with substantial completion no more than four*

DOCUMENT 00410 – BID FORM

(4) weeks later than the start of site work and final completion no later than five (5) weeks after the start of site work. Final completion shall be on or before December 23, 2020.

Add / Deduct \$ _____
(Circle One) (Amount)

Dollars

Alternate No. 3: Furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract Documents for all work associated with the installation a 15' high new ball barrier netting system in lieu of the 20' high ball barrier system required in the base bid.

Add / Deduct \$ _____
(Circle One) (Amount)

Dollars

Alternate No. 3A: : Furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract Documents for all work associated with the installation a 15' high new ball barrier netting system in lieu of the 20' high system from both ends of the field up to the 10 yard line on the football field. Price shall include all four (4) corners of the field.

Add / Deduct \$ _____
(Circle One) (Amount)

Dollars

(Addendum No. 1)

UNIT PRICING

The Contractor is required to bid unit prices on the following items as identified below within Section 012200 – Unit Prices and respective Specification sections. If any extra work is required in these categories beyond the contract requirements, the unit prices shall be used as a basis for determining the amount of additional payment to the Contractor. If any deletions are to be made in these categories, the unit prices shall be used as a basis for determining the amount of credit the Contractor is to allow.

Unit Price UP-1: **20' High** Ball Barrier Netting System \$ _____ per 20' of Net`

Unit Price UP-2: Turf Nailer Boards \$ _____ per LF

Unit Price UP-3: 15' High Ball Barrier Netting System \$ _____ per 20' of Net

(Addendum No. 1)

DOCUMENT 00410 – BID FORM

The use of the words, "Complete in Place" in the Unit Price Schedule shall be understood to mean "complete in place including all labor, materials, tools, equipment, excavation, restoration and testing." All items required for completion of the project but are not identified in the Bid Form shall be considered as incidental to the Work. No additional payment will be made for an incidental item or work.

I / We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule Impact they may have

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids (60 days for School Districts and Department of Education), and the undersigned shall abide by the Bid Security forfeiture provisions Bid Security is attached to this Bid

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I / We be awarded this contract, I / We pledge to achieve substantial completion of all the work within calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws, that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required, that the bid is legal and firm, that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents

I am / We are an Individual / a Partnership / a Corporation

By _____
(Individual's / General Partner's / Corporate Name)

Trading as _____

State of Corporation _____

Business Address _____

DOCUMENT 00410 – BID FORM

Witness: _____ **By:** _____
(SEAL) _____ **(Authorized Signature)**
_____ **(Title)**
_____ **(Date)**

ATTACHMENTS

Sub-Contractor List Non-Collusion Statement / Non-Collusion Affidavit / Affidavit of Employee Drug Testing Program / Bid Security / (Others as Required by Project Manual)

DOCUMENT 00410 – BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work in order to provide full disclosure and acceptance of the bid by the Owner, it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work. This form must be filled out completely with no additions or deletions.

	Subcontractor Category	Subcontractor Name	Address (City & State)	Subcontractor Tax Payer ID# or DE Business License No.
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

DOCUMENT 00410 – BID FORM

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date (to the Office of Management and Budget, Division of Facilities Management).

All the terms and conditions have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE: _____
(TYPED)

AUTHORIZED REPRESENTATIVE: _____
(SIGNATURE)

TITLE: _____

ADDRESS OF BIDDER: _____

E-MAIL OF BIDDER: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED

DOCUMENT 00410 – BID FORM

AFFIDAVIT OF EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors Implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or In part with public funds

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors that complies with this regulation:

Contractor / Subcontractor Name: _____

Contractor / Subcontractor Address: _____

Authorized Representative: _____
(Typed or Printed)

Authorized Representative: _____
(Signature)

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20__.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED

DOCUMENT 00410 – BID FORM

**Cape Henlopen School District
Synthetic Turf Replacement
Contract No. CHD200001-SYNTURF**

**AFFIDAVIT OF
CRAFT TRAINING COMPLIANCE**

We, the contractor, hereby certify that we and all applicable subcontractors will abide by the contractor and subcontractor craft training requirements outlined below for the duration of the contract. Craft training is defined as "an apprenticeship program approved by and registered with any State apprenticeship agency or the United States Department of Labor."¹ A list of crafts for which there are approved and registered training programs is maintained by the Delaware Department of Labor and can be found at: <https://det.delawareworks.com/documents/Apprenticeship/Apprenticeship%20occupations.pdfP20190215> Information pertaining to subcontractor craft training programs shall be provided by the contractor prior to contract execution.

In accordance with Title 29, Chapter 69, Section 6962(d)(13) of the Delaware Code, contractors and subcontractors must provide craft training for journeyman and apprentice levels if **all** of the following apply:

- A. A project meets the prevailing wage requirement under Title 29, Chapter 69, Section 6960 of the Delaware Code.
- B. The contractor employs 10 or more total employees.
- C. The project is not a federal highway project.

Failure to provide required craft training on the project may subject the successful contractor and/or subcontractor(s) to penalties as outlined in Title 29, Chapter 69, Section 6962(d)(13) of the Delaware Code.

Craft(s) _____
Contractor Name: _____
Contractor Address: _____

Contractor/Subcontractor Program _____
Registration Number _____

On this line also indicate whether DE, Other State (identify) or US Registration Number

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20__.

My Commission expires _____. NOTARY PUBLIC _____

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

¹ Title 29, Chapter 69, Section 6902(7) of the Delaware Code.

SECTION 012200 – UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for unit prices.
- B. Related Sections include the following:
 - 1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
 - 2. Division 1 Section "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

- A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A list of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

SECTION 012200 – UNIT PRICES

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

1. Unit Price UP-1: **20' High** Ball Barrier Netting System

- a. Description: Furnish all materials, perform all labor, and do all else necessary to install additional **20' High** Ball Barrier netting system complete in place.
- b. Unit of Measurement: 20' of Net (Includes 20' of net, one post and one ground sleeve).

(Addendum No. 1)

2. Unit Price UP-2: Turf Nailer Boards

- a. Description: Furnish all materials, perform all labor, and do all else necessary to install new pressure treated synthetic turf nailer boards to replace any boards that may be in poor condition.
- b. Unit of Measurement: Linear Foot.

3. **Unit Price UP-3: 15' High Ball Barrier Netting System**

- a. **Description: Furnish all materials, perform all labor, and do all else necessary to install additional 15' High Ball Barrier netting system complete in place.**
- b. **Unit of Measurement: 20' of Net (Includes 20' of net, one post and one ground sleeve).**

(Addendum No. 1)

END OF SECTION

SECTION 012300 – ALTERNATES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Alternates bidding submission procedures.
- B. Documentation of changes to Contract Sum/Price.

1.2 RELATED SECTIONS

- A. Document 000200 - Instructions to Bidders
- B. Document 000410 - Bid Form: Incorporating monetary value of applicable Alternates.
- C. Document 000520 - Agreement: Incorporation of monetary value of accepted Alternates.
- D. Division 01 Section "Submittal Procedures" for requirements of submittals for proposed alternates; work schedule affected by alternates.
- E. Division 01 Section "Product Requirements" for product options and substitutions.

1.3 SUBMISSION REQUIREMENTS

- A. Submit Alternates indicating the amount to be added to or deducted from the Base Bid for the provision of or deletion of all labor, materials and all other Work incorporated and identified by the Specification Sections and Drawings referenced or affected.
- B. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at the sole discretion of the Owner. Accepted Alternates will be identified in the Owner-Contractor Agreement.
- C. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.4 SCHEDULE OF ALTERNATES

- A. Alternate 1: Furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract Documents for all work associated with the installation new ball barrier netting system from the base bid net system at the both ends of the field up to the 10 yard line on the football field. Price shall include all four (4) corners of the field.
- B. ***Alternate 2: Due to COVID-19 pandemic, and the possibility that the fall sports season could be subject to cancellation after the submission of the bid, the current project schedule may be allowed to be revised to reflect a later start of the project. To accommodate the possibility of this occurring the Owner requests an alternate cost be provided to furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract***

SECTION 012300 – ALTERNATES

Documents for all work associated with the installation replacement synthetic turf and installation of the new ball barrier netting system agreed to under the contract commencing site work after September 4, 2020 with substantial completion no more than four (4) weeks later than the start of site work and final completion no later than five (5) weeks after the start of site work. Final completion shall be on or before December 23, 2020.

- C. ***Alternate 3: Furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract Documents for all work associated with the installation a 15' high new ball barrier netting system in lieu of the 20' high ball barrier system required in the base bid.***

- D. ***Alternate 3A: Furnish all materials, perform all labor, and do all else necessary to complete the Work in accordance with the Contract Documents for all work associated with the installation a 15' high new ball barrier netting system in lieu of the 20' high system from both ends of the field up to the 10 yard line on the football field. Price shall include all four (4) corners of the field.***

(Addendum No. 1)

PART 2 - PRODUCTS - Not Used.

PART 3 - EXECUTION - Not Used.

END OF SECTION

SECTION 329220 – SYNTHETIC TURF SURFACING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Synthetic athletic field turf system.
- B. Aggregate drainage base course and finished course for synthetic turf.

1.2 RELATED DOCUMENTS

- A. None.

1.3 REFERENCES

- A. NFHS - National Federation of State High School Associations, Rules and Regulations, current edition.
- B. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition
- C. ASTM Standard Test Methods:
 - 1. D1557 - Test Method for Moisture Density Relations of Soil-Aggregate Mixtures Using a 10-lb. Rammer and 18-inch Drop
 - 2. D1577 - Standard Test Method for Linear Density of Textile Fiber
 - 3. D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering
 - 4. D418 - Standard Test Method for Testing Pile Yarn Floor Covering Construction
 - 5. D1338 - Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings
 - 6. D1682 - Standard Method of Test for Breaking Load and Elongation of Textile Fabrics
 - 7. D5034 - Standard Test Method of Breaking Strength and Elongation of Textile Fabrics
 - 8. F1015 - Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing surfaces
 - 9. D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity
 - 10. D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor coverings
 - 11. F355 - Standard Test Method for Shock-Absorbing Properties of Playing Surfaces
 - 12. F1936 - Standard Test Method for Shock-Absorbing Properties of North American Football Field Playing Systems as Measured in the Field
 - 13. D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort
 - 14. E-648 - Flooring Critical Radiant Panel Test (Flame Spread)
 - 15. F2117 - Vertical Rebound Characteristics of Sports Surface Systems; Acoustical Measurements (Soccer)
 - 16. F2898 - Permeability of Synthetic Turf Sports Field Base Stone and Surface System by Non-Confined Area Flood Test Method
 - 17. BS7044 - Section 2.2, Methods for Determination of Person/Surface Interaction Method; Determination of Traction (Rotational Resistance)
 - 18. F1551-03 - Suffix: DIN 18-035, Part 6; Water Permeability of Synthetic Turf Systems

SECTION 329220 – SYNTHETIC TURF SURFACING

19. F1951-14 - Determination of Accessibility of Surface System Under and Around Playground Equipment

1.4 SUBMITTALS FOR REVIEW PRIOR TO AWARD

- A. Substitutions: The turf systems listed in this Section cannot be substituted after Proposal Opening.
- B. Evidence of Non-Infringement: Letter from turf manufacturer certifying that the turf system does not violate any other manufacturer's patents, patents allowed, or patents pending.
- C. Manufacturer Certification: Submit from synthetic turf manufacturer a product specification sheet certifying that the synthetic turf products to be supplied under this Section meet or exceed the specified requirements. The specification sheet must be accompanied by quality control test data report current within three months of proposal date from manufacturing plant.
- D. Turf System Installer and Contractor List of References: Provide a reference list for all public and private high schools, colleges/universities, and other facilities where the synthetic turf carpet system products required by these specifications, and alternate systems as may be offered by the vendor/manufacturer, are installed. The list shall include the name of the facility, year of installation, contact name, and product installed, including pile height.
- E. Sample Warranty: Manufacturer's Warranty that will be issued for this project must be provided. Provide a Manufacturer's sample pre-paid third party insured warranty. The Manufacturer's Policy must be in force at time of proposal.
- F. Synthetic turf system shall be approved as ADA Handicap accessible as determined by Test Method - ASTM 1951-14 (Standard Specification for Determination of Accessibility of Surface Under and Around Playground Equipment).
- G. Product Samples: 12" x 12" square rag sample for each system specified, in each color scheduled on the Drawings, including field lines, letters, and logos.
- H. Turf System Manufacturer Qualifications: Submit qualifications as noted in Sub-Section 1.9A of this specification.

1.5 SUBMITTALS FOR REVIEW DURING CONSTRUCTION

- A. Stone Gradation Certification: Sieve analysis from aggregate supplier documenting that stone gradation for finished aggregate meets specified requirements. Submit one-quart aggregate sample for each classification representative of material source.
- B. Crumb Rubber Infill Certification:
 - 1. Documentation from Crumb Rubber Infill (CRI) suppliers shall certify that the CRI is derived from only material produced in compliance with North American tire manufacturing specifications.

SECTION 329220 – SYNTHETIC TURF SURFACING

2. Suppliers of CRI shall provide in writing that they maintain an ongoing Quality Control program meeting all the standards of the STC Guidelines for CRI Used in Synthetic Turf Fields and capable of meeting all the specifications of the selected synthetic turf manufacturers product.
 3. Shipment and/or Order Certification shall include at least the following information:
 - a. Type and origin of raw material (certify that it comes from tires)
 - b. Production facility
 - c. Production method
 - d. Fiber content (%)
 - e. CRI sieve/gradation analysis
- C. Sand Gradation Certification: Sieve analysis from aggregate supplier documenting that sand gradation meets synthetic turf manufacturers specified requirements.
- D. Bills of lading documenting the amount of sand and rubber for the turf infill delivered to the site as well as documentation for the actual amount of sand and rubber material used for the infill.
- E. Shop Drawings:
1. Field Marking Plan, including dimensions, line widths, and colors for each sport scheduled and details with dimensions for all letters, numbers, logos, and other field ornamentation. Provide note/certification on drawing that all game markings and field layout is in accordance with prevailing sport governing body, such as NFHS or NCAA as applicable.
 2. Provide review certificate on shop drawing for owner to acknowledge review and acceptance of synthetic turf field shop drawing, including signature and date of review/acceptance line for owner signature.
 3. Field Seaming Plan, including location of all turf carpet seams and individual sections of turf (rolls), including approximate width and length.
 4. Attachment Details for turf anchoring where method of attachment is different from that scheduled on Drawings.
- F. Turf Fiber: Submit company name of fiber manufacturer, fiber composite, type of fiber, and statement that fiber meets or exceeds that required by the turf company specifications for the carpet systems specified.
- G. Product Certification:
1. Manufacturer's Certification: Not Used.
 2. Manufacturer Quality Control Test Results: Third party independent test results taken during the carpet system manufacturing process for the actual carpet system delivered to the site verifying compliance with the product reference standards and criteria. Quality control test reports shall be submitted for verification to the owner within 10-days of delivery of the carpet system to the project site.
 - a. Pile height, face weight, and total fabric weight per ASTM D5848
 - b. Primary and secondary backing weights per ASTM D5848
 - c. Tuft bind per ASTM D1335
 - d. Grab tear strength per ASTM D1682 or D5034
 - e. Water permeability per ASTM D4491

1.6 SUBMITTALS FOR CLOSEOUT/CLOSEOUT PROCEDURES

SECTION 329220 – SYNTHETIC TURF SURFACING

- A. Representative of manufacturer must review and accept installation of field.
- B. Coordinate substantial completion inspection with owner and owner’s representatives. Perform corrective action of any defects or areas of non-compliance within 72-hours of receipt of written notification, or at schedule required by owner to permit occupancy of the field.
- C. Deliver bills of lading for all infill materials to verify compliance with infill weight and mix ratio of sand and rubber.
- D. Deliver all warranty documents and maintenance manuals.
- E. Stockpile excess synthetic carpet material desired to be retained by the owner at location designated by the owner.
- F. Coordinate impact attenuation testing (g-max test) by certified third party professional and provide test results to owner.
- G. Completely remove all waste materials, trash, equipment, and perform final site housekeeping.
- H. Certification Statement: Letter from manufacturer or installer certifying that all markings as installed meet the dimensional and accuracy requirements of the NFHS or other governing athletic association.
- I. Laboratory Test Reports: Submit certified test reports from independent laboratory certifying that the supplied turf products meet specified requirements. Test reports shall be from the production run of the turf supplied for the project.
 - 1. Pile Height, Face Width, and Total Fabric Weight, ASTM D418 or D5848.
 - 2. Primary and Secondary Backing Weights, ASTM D418 or D5848.
- J. Warranty: Submit final warranty and evidence of third-party insurance policy, fully executed and with original signatures.
- K. Certificates for carpet disposal from authorized waste management facility, or recycling facility, certified to receive synthetic turf carpet materials/construction waste products. Right of ownership of the carpet system or infill materials is not granted to the contractor without expressed written consent of the owner.
- L. Infill Density Certification: Submit bills of lading/material delivery receipts for synthetic turf sand and rubber infill materials.
 - 1. Bills of lading shall bear the name of the project/delivery address, quantity of materials delivered, source/location of origin of infill materials and/or manufacturer, and date of delivery.
 - 2. Submit original unedited certificates. Originals shall be made available to the owner when requested.
- M. Field Maintenance and Care Manuals: Submit two (2) copies in three ring binders covering owner field maintenance responsibilities to maintain warranty in full effect and

SECTION 329220 – SYNTHETIC TURF SURFACING

other activities such as regular grooming, deep grooming, debris pick-up, line painting and removal, decontamination of surface, inlay or seam repairs, infill replenishment, and similar owner required operations for the life of the warranty period.

- N. Impact Attenuation (Gmax) Test Results: submit independent third-party test report performed in accordance with ASTM F1936 within 10-days of receipt of substantial completion certificate unless owner requests delay of testing (for up to 30-days following owner's first use of the field).
- O. Project Record Documents:
 - 1. As-Built Survey: Not Used.
 - 2. Provide record drawing as a plan redline of all field changes and modifications to the work, including adjustments to storm sewer piping, athletic field subdrainage system, underground utilities, existing underground features abandoned in-place, uncharted utilities discovered during construction, and other pertinent information for owner record documents of the construction.

1.7 TURF SYSTEM INSTALLER AND CONTRACTOR QUALIFICATIONS

- A. All contractors employed for the installation of the synthetic turf system and aggregate subbase must have installed a minimum of twenty (20) synthetic turf fields within the last five years. They must also have worked on at least five (5) similar size projects within the last three (3) years. Installer shall provide a list of fields for those five (5) projects as well as additional similar projects and a list of references to verify the satisfactory completion of the projects. If the installer and company performing field construction are different, qualification criteria for each contractor/company employed in the execution of the project must be identified and qualification information provided.
- B. Provide workmen qualified and skilled in the specific type of synthetic turf installation.
- C. Provide supervisory personnel certified by, or directly employed by, the Turf Company.
 - 1. Provide same supervisory personnel for entire duration of project unless replacement is required or approved by Owner.
 - 2. Supervisor shall have a minimum of ten (10) years' experience in the installation of infill type synthetic turf systems and shall be present on site at all critical components of the carpet system installation.
- D. Provide representative on site to verify installation and warranty requirements, including subgrade, drainage, and subbase installation.

1.8 TURF SYSTEM MANUFACTURER QUALIFICATIONS

- A. The manufacturer of the synthetic turf carpet system shall demonstrate and provide documentation with the proposal compliance with the following qualification criteria:
 - 1. Not less than 20 installations of the manufacturer offered system, meeting the requirements of Paragraph 2.3 of this Section, within the continental United States installed within 24-months of the proposal date. Installation list shall include facility name, product installed, substantial completion date, and location/address.
 - 2. Not less than 5 installations of the manufacturer offered system, meeting the requirements of Paragraph 2.3 of this Section, within approximately 150 miles of

SECTION 329220 – SYNTHETIC TURF SURFACING

the project site installed within 48-months of the proposal date. Installation list shall include facility name, product installed, substantial completion date, and location/address.

3. Number of fields of equal or similar construction to that as the manufacturer offered product installed in the continental United States in **2007 the last 10 years and earlier** with not less than three (3) having been installed within approximately 200 miles of the project site. Installation list shall include facility name, product installed, substantial completion date, and location/address.

(Addendum No. 1)

1.9 AGGREGATE DRAINAGE BASE CERTIFICATION

- A. Turf Company installer is required to inspect and confirm the aggregate drainage base is prepared to specified requirements prior to turf installation.
- B. Turf Company installer must provide a letter to the Owner indicating their acceptance of the construction of the aggregate drainage base prior to installation of the synthetic turf surfacing.

1.10 PRE-INSTALLATION MEETING

- A. Convene meeting to review installation requirements, scheduling, delivery and storage of materials, procedures, confirm field layout and markings, turf colors and logos, review any required aggregate base connections and other items a minimum of one (1) week prior to beginning Work of this Section.

1.11 COORDINATION

- A. Coordinate and schedule Work to meet schedule requirements.

1.12 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Deliver products in original unopened packaging with manufacturer's product identification. Delivery shall only be at times set by the Owner.
- B. Store all materials in dry area, under cover, and elevated above grade at locations designated by the Owner.
- C. Do not deliver materials until scheduled for installation. Schedule delivery and storage of materials on site to meet scheduling and installation requirements.
- D. Bulk Materials: Deliver materials in clean, washed, and covered trucks or in sealed bags to prevent contamination.
 1. Coordinate location of bulk material storage to avoid interference with work of other Contracts and Owner use of facilities.
 2. Store material to avoid contamination by drainage and cover with waterproof materials when covered storage is not available.

1.13 WARRANTY

SECTION 329220 – SYNTHETIC TURF SURFACING

- A. Provide a Warranty covering defects in materials and workmanship of the turf for a minimum period of ten (10) years from the date of Substantial Completion. Warranty shall stipulate that the turf manufacturer onsite representative has inspected the installation and that the work conforms to the manufacturer's requirements.
- B. Warranties: The Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a period of ten (10) years from the date of substantial completion. The turf manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty period shall consist of a third party insured, pre-paid warranty for a period not less than 8 years. The remaining two (2) years of the required warranty period can be covered by a manufacturer's supplemental warranty. The entire 10-year term of the warranty coverage shall be non-prorated.

The Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. Prior to final payment for the synthetic turf, the Contractor shall submit to owner proof in writing of the insurance policy, guaranteeing the warranty to the Owner. The insurance must reflect the following values: 1) minimum of seven - million dollar annual aggregate 2) Must cover full 100% replacement value of total square footage installed, minimum of \$7.00 per sq. ft. 3) Pre Paid 8 year third party policy must be issued by a carrier with an A.M. Best rated "A" or better rating. Policy can not include any form of deductible amount to be paid by Owner.

- C. Warranty shall be signed and executed by a principal of the firm, including title, of the firm furnishing the warranty.
- D. The terms of the Warranty may specifically exclude vandalism, and acts of God beyond the control of the owner or the manufacturer.
- E. The terms of the Warranty shall specifically include coverage for normal wear for all sport activities, including games and practices, scheduled on the Drawings.
- F. Identify and detail all coverage and exclusions, including, but not limited to, the following:
 - 1. Length of policy
 - 2. Name of the carrier
 - 3. Method for payment of the policy. Policy shall be pre-paid and non-cancelable.
 - 4. Limit for single claims
 - 5. Limit for aggregate claims
 - 6. Additional policy features of importance
- G. Warranty shall cover defects in the installation, workmanship, and further warrant that the Work was executed in accordance with the Manufacturer's recommendations, specifications, and any written directives of the Manufacturer's onsite representative.

SECTION 329220 – SYNTHETIC TURF SURFACING

- H. The synthetic field turf must maintain an ASTM F355 G-Max as stipulated by the Manufacturer's product performance requirements as specified in this Section.
- I. The Manufacturer shall be responsible for providing the Owner with a G-Max testing and turf evaluation report, of all warranty requirements, from an independent testing agency. The testing and evaluations by the independent testing agency shall be conducted at one-year intervals, until the end of the warranty period. Testing shall commence one year after the date of substantial completion of the synthetic turf installation. G-Max testing shall include testing as indicated in this Section.
- J. A representative of the Manufacturer shall provide an annual visit in on the anniversary of the date of substantial completion during the warranty period. The Manufacturer's representative shall meet with the Owner's representative to discuss the current maintenance practices of the School District Staff and verify that the synthetic turf is being maintained properly in accordance with the provisions of the warranty.
- K. The Contractor shall be responsible for providing replacement of up to 2,000 sf of synthetic turf within the goal areas, faceoff area, etc. at least one time as directed by the School District during the ten-year warranty period of the field.
- L. Other items that the Contractor shall provide to the Owner shall consist of 300 lineal feet of each game line color cut into 4" wide strips (boxed/labeled), 2000 lbs. Sand (in bulk), 2000 lbs. Rubber (1 super sack) and six (6) tubes of Mapei Ultra-Bond Turf 527 Premium Urethane Adhesive or approved equal.
- M. The School District will consider alternative Warranty policies provided the policy meets or exceeds coverage requirements as it pertains to all materials, workmanship and performance criteria outlined in this Section 1.13. Consideration of such a policy by the School District does not indicate acceptance of said policy. Approval of the alternative policy is wholly at the discretion of the School District.

1.14 INSTALLATION WARRANTY

- A. Installer shall warrant and repair all defects arising from new construction for a period of one (1) year following the date of project substantial completion.
- B. Warranty shall include defects in field planarity, settlement, concrete construction, defective construction materials, and all workmanship. The warranty does not cover acts of god or unknown geologic conditions, such as the formation of sinkholes.
- C. All repairs and corrections made during the warranty period shall be warranted for one (1) year following the date of repair.

1.15 MAINTENANCE TRAINING

- A. Provide on-site maintenance training to Owner staff in use of turf maintenance equipment and general turf maintenance procedures, including demonstration of items included in Maintenance Manual. This training must be for a minimum of two (2) hours.

SECTION 329220 – SYNTHETIC TURF SURFACING

PART 2 - PRODUCTS

2.1 SYNTHETIC TURF CARPET SYSTEM

- A. The synthetic turf carpet system shall be a component system.
1. Carpet System: Constructed of polyethylene fibers broadloom tufted into a fibrous and porous urethane coated or selectively coated urethane backing.
 - a. Parallel Slit Film (“Yarn”): True 100-percent polyethylene fiber.
 2. Infill: Controlled mixture of graded washed silica sand and processed SBR crumb rubber.
 3. Accessories: Glue, thread, paint, seaming fabric, and other materials used to install and mark the field as approved by the manufacturer.
- B. Synthetic Turf Backing: The synthetic turf carpet shall consist of true parallel slit film fibers tufted into a primary backing and secondary backing.
1. Primary Backing: Double-layered polypropylene UV treated fabric.
 2. Secondary Backing: Porous, heat-activated urethane that provides complete coverage of all stitching and firmly locks turf fiber in place.
- C. Carpet Roll Width, Length, and Seams:
1. Furnished and installed in widths of not less than 15-feet, excluding perimeter areas of the carpet where cutting is required for configuration and dimension of field or total area of turf surfacing.
 2. Furnish and install in lengths to extend from sideline to sideline of playing field without splicing. Head seams are not permitted within the playing area of the field.
 - a. Perimeter primary field line (marking) shall be tufted into the carpet at specified dimension for all turf rolls used to form the playing field side lines and end lines.
 - b. Football and soccer field lines, goal lines, end lines shall be permanently tufted into the synthetic carpet along the edge of each roll where possible.
 - c. Sideline roll shall be placed perpendicular to the turf rolls comprising the field, with the perimeter line directly abutting the field turf rolls.
 - d. Coordinate with owner to determine primary field where multiple field layouts are proposed. Plan turf seams to eliminate head seams in primary playing field or as otherwise approved by owner.
 3. Turf Seams: All seams shall be sewn along the selvedge edging flap of the turf roll with a union special sewing machine. Seams secured by other means including adhesive (“glued seams”) are not acceptable.
 - a. Use of formulated synthetic turf adhesive is permitted for repair, corner completions, and to cut in any tick marks and inlaid lines as scheduled. Adhesive shall also be utilized for securing turf backing to perimeter concrete curb anchor or wood “nailer”.
 - b. Seams shall be flat, tight, and permanent with no separation or fraying. Seams shall not be butted and shall be provided with overlapped backing. All field fibers on the overlapped backing must be sheared to the backing and the backing must be overlapped 6-inches minimum.
- D. Synthetic Turf Adhesive and Seaming Fabric: Use for inlaid lines, markings, and tick marks only. Sew all turf seams.

SECTION 329220 – SYNTHETIC TURF SURFACING

1. Adhesive: “Hot Meld” method or one-part moisture-cured polyurethane obtained from single source, equal to 34-g, Synthetic Surfaces, Inc., Scotch Plains, NJ, or equal as approved by Synthetic Turf Manufacturer.
2. Seaming Tape: High quality cord/thread tape with a minimum tape width of not less than 12-inches.

2.2 SYNTHETIC TURF CARPET INFILL

- A. All carpet infill materials shall be inspected and approved by the manufacturer upon delivery to the project site. All materials not meeting the manufacturer’s infill requirements shall be rejected and replaced with approved infill material.
- B. Provide infill consisting of a resilient granular system of graded subangular or rounded uniformly sized silica sand and SBR rubber granules.
- C. Provide infill material free of metal, glass, soil, and other contaminants. Supplier must provide verification from a third-party inspection agency for every 10,000 pounds of infill that the infill material meets this requirement.
- D. The sand component of the infill shall be no greater than 60% of the infill volume as measured by weight. Infill ratio shall be approved by owner prior to delivery and installation of infill materials.
- E. All infill rubber shall be “black” in color, free of dust and particulates, delivered in 2,000 lb. sealed bags with weight, manufacturer, lot/production run, and production date identified.
- F. ***Bidders shall include in their costs the recycling of the existing rubber / sand infill for re-use in the new turf system.***
- G. ***Bidders shall include in their costs a minimum of 80,000 lbs. of new SBR rubber to supplement the recycled infill to achieve the required 6 lbs. / SF infill weight. The price should be identified in the space provided on the Bid Form.***

(Addendum No. 1)

2.3 SYNTHETIC TURF SYSTEMS

- A. Synthetic Turf System: Furnish and install synthetic turf systems in accordance with the following specifications:
 1. Base Bid A – Manufacturer: Fieldturf

ASTM Standard	Specification	Field Requirement
	Yarn Structure	Slit Film
D1577	Fiber Denier	10800 min.
D418/D5848	Pile Height (inches)	2.25” min.
D418/D5848	Min. Pile Weight (oz / sq. yd.)	48
D1335	Tuft Bind (W/ Infill) (lbs. force)	8 lbs. min.

SECTION 329220 – SYNTHETIC TURF SURFACING

D1682/D5034	Grab Tear (Width) (lbs. force)	200 min.
D1682/D5034	Grab Tear (Length) (lbs. force)	200 min.
DIN18-035	Carpet Permeability (inch/hour)	40 min.
F1936	Impact Attenuation (Gmax)	<125 installed <200 warranty
	Minimum Infill Weight (lbs./SF)	6.0 min

2. Base Bid B – Manufacturer: Turf Nation

ASTM Standard	Specification	Field Requirement
	Yarn Structure	Slit Film
D1577	Fiber Denier	9000 min.
D418/D5848	Pile Height (inches)	2.25" min.
D418/D5848	Min. Pile Weight (oz / sq. yd.)	48
D1335	Tuft Bind (W/ Infill) (lbs. force)	8 lbs. min.
D1682/D5034	Grab Tear (Width) (lbs. force)	200 min.
D1682/D5034	Grab Tear (Length) (lbs. force)	200 min.
D4491/DIN18-035	Carpet Permeability (inch/hour)	30 min.
F1936	Impact Attenuation (Gmax)	<125 installed <200 warranty
	Minimum Infill Weight (lbs./SF)	6.0 min

3. Base Bid C – Manufacturer: A-Turf

ASTM Standard	Specification	Field Requirement
	Yarn Structure	Slit Film
D1577	Fiber Denier	10000 min.
D418/D5848	Pile Height (inches)	2.25" min.
D418/D5848	Min. Pile Weight (oz / sq. yd.)	48
D1335	Tuft Bind (W/ Infill) (lbs. force)	8 lbs. min.
D1682/D5034	Grab Tear (Width) (lbs. force)	250 min.
D1682/D5034	Grab Tear (Length) (lbs. force)	250 min.
D4491/DIN18-035	Carpet Permeability (inch/hour)	20 min.
F1936	Impact Attenuation (Gmax)	<125 installed <200 warranty
	Minimum Infill Weight (lbs./SF)	6.0

4. Base Bid D – Manufacturer: Sprinturf

ASTM Standard	Specification	Field Requirement
	Yarn Structure	Slit Film
D1577	Fiber Denier	10000 min.
D418/D5848	Pile Height (inches)	2.25" min.

SECTION 329220 – SYNTHETIC TURF SURFACING

D418/D5848	Min. Pile Weight (oz / sq. yd.)	48
D1335	Tuft Bind (W/ Infill) (lbs. force)	8 lbs. min.
D1682/D5034	Grab Tear (Width) (lbs. force)	250 min.
D1682/D5034	Grab Tear (Length) (lbs. force)	250 min.
D4491/DIN18-035	Carpet Permeability (inch/hour)	40 min.
F1936	Impact Attenuation (Gmax)	<125 installed <200 warranty
	Minimum Infill Weight (lbs./SF)	6.0

5. Base Bid E – Manufacturer: AstroTurf

ASTM Standard	Specification	Field Requirement
	Yarn Structure	Slit Film
D1577	Fiber Denier	10000 min.
D418/D5848	Pile Height (inches)	2.25" min.
D418/D5848	Min. Pile Weight (oz / sq. yd.)	48
D1335	Tuft Bind (W/ Infill) (lbs. force)	8 lbs. min.
D1682/D5034	Grab Tear (Width) (lbs. force)	200 min.
D1682/D5034	Grab Tear (Length) (lbs. force)	200 min.
D4491/DIN18-035	Carpet Permeability (inch/hour)	30 min.
F1936	Impact Attenuation (Gmax)	<125 installed <200 warranty
	Minimum Infill Weight (lbs./SF)	6.0 min

6. Base Bid F – Manufacturer: Shaw

ASTM Standard	Specification	Field Requirement
	Yarn Structure	Slit Film
D1577	Fiber Denier	9000 min.
D418/D5848	Pile Height (inches)	2.25" min.
D418/D5848	Min. Pile Weight (oz / sq. yd.)	48
D1335	Tuft Bind (W/ Infill) (lbs. force)	10 lbs. min.
D1682/D5034	Grab Tear (Width) (lbs. force)	200 min.
D1682/D5034	Grab Tear (Length) (lbs. force)	200 min.
D4491/DIN18-035	Carpet Permeability (inch/hour)	25 min.
F1936	Impact Attenuation (Gmax)	<125 installed <200 warranty
	Minimum Infill Weight (lbs./SF)	6.0 min

(Addendum No. 1)

7. Base Bid G – Manufacturer: Hellas Construction

ASTM Standard	Specification	Field Requirement
	Yarn Structure	Slit Film

SECTION 329220 – SYNTHETIC TURF SURFACING

<i>D1577</i>	<i>Fiber Denier</i>	<i>10750 min.</i>
<i>D418/D5848</i>	<i>Pile Height (inches)</i>	<i>2.25" min.</i>
<i>D418/D5848</i>	<i>Min. Pile Weight (oz / sq. yd.)</i>	<i>48</i>
<i>D1335</i>	<i>Tuft Bind (W/ Infill) (lbs. force)</i>	<i>10 lbs. min.</i>
<i>D1682/D5034</i>	<i>Grab Tear (Width) (lbs. force)</i>	<i>300 min.</i>
<i>D1682/D5034</i>	<i>Grab Tear (Length) (lbs. force)</i>	<i>300 min.</i>
<i>D4491/DIN18-035</i>	<i>Carpet Permeability (inch/hour)</i>	<i>40 min.</i>
<i>F1936</i>	<i>Impact Attenuation (Gmax)</i>	<i><130 installed <190 warranty</i>
	<i>Minimum Infill Weight (lbs./SF)</i>	<i>6.0 min</i>

(Addendum No. 1)

8. Base Bid H – Manufacturer: Act Global

<i>ASTM Standard</i>	<i>Specification</i>	<i>Field Requirement</i>
	<i>Yarn Structure</i>	<i>Slit Film</i>
<i>D1577</i>	<i>Fiber Denier</i>	<i>10000 min.</i>
<i>D418/D5848</i>	<i>Pile Height (inches)</i>	<i>2.25" min.</i>
<i>D418/D5848</i>	<i>Min. Pile Weight (oz / sq. yd.)</i>	<i>48</i>
<i>D1335</i>	<i>Tuft Bind (W/ Infill) (lbs. force)</i>	<i>8 lbs. min.</i>
<i>D1682/D5034</i>	<i>Grab Tear (Width) (lbs. force)</i>	<i>200 min.</i>
<i>D1682/D5034</i>	<i>Grab Tear (Length) (lbs. force)</i>	<i>200 min.</i>
<i>D4491/DIN18-035</i>	<i>Carpet Permeability (inch/hour)</i>	<i>40 min.</i>
<i>F1936</i>	<i>Impact Attenuation (Gmax)</i>	<i><125 installed <200 warranty</i>
	<i>Minimum Infill Weight (lbs./SF)</i>	<i>6.0 min</i>

(Addendum No. 1)

- A. The various products specified by name are given to establish a standard of quality. It is not the intent to limit the bidder, the bid, or the evaluation of the bid to any one product specified. A bid containing an alternative that does not meet the specifications may be declared non-responsive.
- B. Each bid shall include Manufacturer Certifications (data sheet(s) and literature) which documents full compliance with the specifications. A bid that does not include this documentation may be declared non-responsive.

2.3 RESILIENT UNDERLAYMENT (PRE-MANUFACTURED RESILIENT SHOCK PAD)

- A. Not Used.

2.4 NEW AGGREGATE BASE RESTORATION MATERIALS

- A. In all areas of new construction requiring removal or displacement of the existing synthetic turf field aggregate base course, provide graded mixture of crushed stone or crushed gravel for base aggregate and dense graded mixture of natural or manufactured crushed stone for finishing layer meeting the following requirements:

SECTION 329220 – SYNTHETIC TURF SURFACING

US STANDARD SIEVE	BLENDED BASE AGGREGATE MIX	OPEN GRADED BASE AGGREGATE (AASHTO NO. 57)	FINISHED AGGREGATE (AASHTO NO. 8)
PERCENT PASSING			
2"			
1-1/2"	100	100	
1"	95-100	95-100	
3/4"	80-100		
1/2"	60-80	25-60	100
3/8"	30-50		85-100
#4	20-40	0-10	10-30
#8	10-30	0-5	0-10
#16			0-5
#30	5-15		
#50			
#100			
#200	0-5		

- B. Where a single blended processed aggregate mix cannot be obtained from a local quarry source, a two (2) layer aggregate base system may be utilized consisting of the open graded and blended fine aggregate as scheduled. The complete two-layer system must meet all specified compaction, drainage rate, and tolerance requirements as described herein.
- C. Aggregate materials shall not exceed 12-percent material loss as determined by ASTM C88, sulfate soundness test.
- D. Permeability: final gradation of base and finished aggregate (when utilized) having permeability not less than 20-inches/hour.

2.5 ACCESSORIES

- A. Geotextile Fabric: Polypropylene, nonwoven, needle-punched construction fabric stabilized to resist degradation due to ultraviolet exposure, non-biodegradable, and resistant to commonly encountered soil chemicals, mildew, and insects, stable within a PH range of 2 – 13.
- B. Geotextile fabric used as synthetic turf subgrade separation and drainage fabric shall meet the following characteristics:

PROPERTY	TEST METHOD	MIN. AVE. ROLL VALUE
GRAB TENSILE STRENGTH	ASTM D4632	120 LBS.
GRAB TENSILE ELONGATION	ASTM D4632	50%
MULLEN BURST	ASTM D3786	230 PSI
PUNCTURE	ASTM D4833	70 LBS.
TRAPEZOIDAL TEAR	ASTM D4533	50 LBS.

SECTION 329220 – SYNTHETIC TURF SURFACING

UV RESISTANCE	ASTM D4355	70% @ 500 HRS
APPARENT OPENING (AOS)	ASTM D4751	70 SIEVE
PERMITTIVITY	ASTM D4491	1.2 SEC ⁻¹
PERMEABILITY	ASTM D4491	0.21
FLOW RATE	ASTM D4491	95 GAL/MIN/FT ²

1. Manufacturer Products:

- Propex (AMOCO) Fabrics, Style 4547;
- MIRAFI 140N;
- Or equal.

C. Synthetic Turf Pressure Treated Wood Nailer:

1. 2" x 4" (Nominal) Pressure Treated Lumber to be ramset into existing concrete curb replacing any damaged nailer. For purposes of this bid assume 100 LF of nailer is to be replaced. If less than 100 LF or no replacement is needed, a Change Order (deduct) will be required prior to project closeout based on the provided unit price.

D. Turf Groomer:

1. Integrated Synthetic Sports Turf Groomer (926), as manufactured by Greens Groomer Worldwide or approved equal per manufacturer's specifications.
2. Litterkat Synthetic Turf Sweeper as manufactured by Greens Groomer Worldwide or approved equal per manufacturer's specifications.

PART 3 - EXECUTION

3.5 FIELD QUALITY CONTROL

- A. Review and verify approved shop drawings with owner prior to installation. Perform installation in accordance with approved shop drawings.
- B. Provide direct supervision by designated supervisory personnel certified by the manufacturer for the products specified, including base installation, sewing seams, installation of turf infill, and installation of field markings, game lines, and logos.
- C. Provide only trained technicians, skilled in the installation of the products specified, working under the direct supervision of the approved supervisory personnel, for all cutting, gluing, sewing, shearing, infill operations, topdressing, and brushing.
- D. Verify that new areas of aggregate base construction (restoration) have been reviewed and accepted within tolerance requirements prior to proceeding with installation of carpet system.
- E. Confirm field dimensions and locations of communication boxes, conduits, ground sleeves, and other improvements within field area scheduled on the drawings.

SECTION 329220 – SYNTHETIC TURF SURFACING

- F. Establish string lines and controls to ensure carpet is laid true and square to curb lines.

3.6 EXAMINATION

- A. Verify finished elevations of aggregate finishing course, compaction, and surface planarity prior to installation of synthetic turf.
 - 1. Immediately regrade, recompact, and correct any irregularities prior to installation of synthetic turf.
 - 2. Submit evidence of compliance with finished base surfacing (fine aggregate finish course) tolerance to engineer prior to installation of synthetic turf carpet system.
- B. Verify erosion and sediment control facilities are in place and functioning per design requirements prior to initiating excavation, filling, or subgrade preparation.
- C. Verify that football goal foundations, underdrainage system and components, and other buried utilities and structures are installed and correctly located prior to initiating installation of geotextile fabric and aggregate base course construction.

3.7 TESTING

- A. Synthetic Turf Infill Product Testing: Provide third party testing results for synthetic turf and infill materials as identified in Section 2.2 verifying that infill products meet or exceed synthetic turf system manufacturer requirements.

3.4 SYNTHETIC TURF CARPET SYSTEM REMOVAL

- A. Existing carpet system shall be completely removed from the existing aggregate base course in a manner that minimizes disruption to the existing surface plane.
- B. The existing carpet system shall be removed utilizing specialized equipment manufactured specifically for this type of operation.
- C. Where applicable, protect running track pavement cross-over points from damage during all removal and new construction activities.
- D. Existing carpet system products and non-recycled infill material shall be immediately removed from site or contained within enclosed waste containers. Removed materials are not permitted to accumulate on site.
- E. Disposal of the carpet system and non-recycled infill material in accordance with waste management rules and regulations is at the sole discretion and responsibility of the contractor.

3.5 AGGREGATE BASE RESTORATION AND GRADING

- A. Following carpet system removal and installation of new subsurface drainage improvements, contractor shall “regrade” the existing surface plane to correct ruts and deviations created during removal operations and restore/correct the existing surface

SECTION 329220 – SYNTHETIC TURF SURFACING

plane to uniform slope, grade, and be free of depressions, ridges, high areas, and other imperfections.

- The work includes correction of the surface plane of the field area only and does not extend to correction of inconsistencies that may exist in the field surface cross-slope or the existing synthetic carpet base aggregate.
- B. Install fine aggregate utilizing high flotation equipment to address areas of the existing aggregate base system that cannot be corrected utilizing existing in-place fine aggregate materials. Provision of aggregate material when necessary to correct existing surface planar deficiencies is required as part of the work.
- C. Final laser grade finished surface utilizing turf type tractor with calibrated spreader to ensure uniform distribution or lightweight grader with high flotation tires and hydraulically controlled laser blade.
- D. Maintain uniform thickness and avoid forcing fine aggregate into existing underlying open graded aggregate.
- E. Where existing fine aggregate exceeds 2-inches in any location and additional fine aggregate is required to correct base deficiencies, remove fine aggregate, and adjust open graded base aggregate so that not more than 2-inches of fine aggregate depth will be present.
- F. Compact all areas of new aggregate base construction/restoration required for installation of new turf nailer, and other work where the existing drainage base requires excavation using 5-ton roller or equivalent. Static vibration equipment is not permitted in compaction process.
- G. Surface planarity: surface plane shall be not deviate by more than 1/4" (0.02') when measured with a 10-foot straight edge in any direction.

3.6 SYNTHETIC TURF INSTALLATION

- A. General:
1. Do not install synthetic turf over aggregate finished course or resilient underlayment (if applicable) until surface tolerance has been visually reviewed and survey verification completed. Correct any irregularities prior to installation of synthetic turf surfacing.
 2. Fan or unfold fiber tufts prior to installation. Rolling or spiraling of tufts is not acceptable.
- B. Install carpet rolls directly over finished and stable fine aggregate surface or resilient underlayment (if applicable). Avoid disruption of base planarity in handling of carpet installation equipment traffic. Immediately repair/restore any damaged area of aggregate base course.
- C. Lay full width rolls across the primary playing field from sideline to sideline. Turf shall be of sufficient length to extend across the playing field area without head or cross seams.

SECTION 329220 – SYNTHETIC TURF SURFACING

- D. Stretch carpet during installation to prevent wrinkles and irregularities in surface plane.
- E. Sew all seams using double bagger stitches and manufacturer approved thread. Sew seams flat and tight, without separation or fraying.
- F. After all rolls for the playing surface have been installed, install sideline rolls at right angles to the playing field turf extending beyond the curb line. Excess turf shall be trimmed neat and finish to form seamless transition at perimeter curb on edge of field carpet anchor.
- G. Stretch carpet to remove irregularities and anchor perimeter turf to concrete turf anchor/edging. Anchor to concrete lip, curb, or “nailer” as scheduled utilizing turf adhesive suitable for bonding to the anchor material.
- H. Install all “non-tufted” lines, markings, numbers, letters, logos, and other inlaid portions of synthetic carpet prior to installation of infill.
 - 1. Install inlays in accordance with the approved shop drawings.
 - 2. Install inlaid markings, lines, logos, and lettering to carpet backing with synthetic turf adhesive approved by the turf manufacturer. Large logos, lettering, or inlays may be installed by cutting and removing the synthetic carpet completely and installing the inlay utilizing seaming tape and synthetic turf adhesive.
- I. Synthetic Turf Infill Installation:
 - 1. Verification: Verify all game lines and scheduled field markings are installed, straight, correct, and accurate prior to proceeding with infilling procedures.
 - 2. Install infill in numerous thin lifts at a uniform rate for each lift. Do not install infill when material is wet.
 - 3. Brush infill between lifts concurrently utilizing a motorized rotary broom and groomer brush.
- J. Infill material shall consist of a homogeneous blend of silica sand and processed SBR crumb rubber.
 - 1. The combined total weight of the sand and rubber infill installed shall not be less than 6 lbs. per square foot for 2.25” tufted field.
 - 2. The sand infill ratio by weight shall not be more than 60-percent or less than 40-percent. Review infill ratio with owner prior to delivery or installation of infill materials.
 - 3. Provide shipping receipts/bills of lading to owner for all infill materials as evidence of weight and ratio of infill material installed.
- K. Installed the homogeneous mixture of sand and rubber at the approved ratio.
- L. Topdress finished infill with a thin final course of rubber. The particle size of the topdressing course shall be in accordance with the turf manufacturer requirements.
- M. Fibrillate field surface with nylon rotary brush to groom the field. Remove all loose tufts, glue, or other material from finished field surface.

SECTION 329220 – SYNTHETIC TURF SURFACING

- N. Testing and Verification: Provide the following reports and information prior to, or in conjunction with, request for substantial completion:
1. Impact Attenuation (Gmax) Test: Perform GMax testing per ASTM F1936 to verify required impact attenuation requirements. Perform testing prior to request for inspection to determine substantial completion. Provide test results to engineer.

3.7 SYNTHETIC TURF CARPET COLOR AND FIELD MARKING SCHEDULE

- A. All markings, lines, letters, numbers, and logos shall be inlaid or tufted. Field markings shall be in accordance with NFHS regulations for each designated sport.
1. Field sizes and markings may be modified by the owner or deviate from referenced standards due to physical field area limitations. Confirm variations from referenced standards with owner prior to installation.
 2. Game Lines and Field Markings (*Stadium*):
 - a. All football game line markings to be continuous and unbroken.
 - b. “Break” all other game line markings where crossing football field markings.

END OF SECTION 329220