



Division of Finance and Business Operations

Procurement & Strategic Sourcing  
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October 10, 2019

**Addendum #3 Combined To  
Request for Proposal  
For Intramural Field: Project 080-326346**

**Minutes of the Pre-bid Conference  
Dated October 2, 2019**

**The Addendum must be acknowledged on your lump sum bid.**

NOTE: You must have attended a pre-bid conference in order to be eligible to bid on a particular project. Receipt of minutes or addenda without being at a pre-bid conference does not qualify your company to bid.

Please find the following questions and clarifications in regards to the above bid opportunity.

**Question 1:** It's my understanding that the base bid product for each turf company is a slit film fiber and the alternate was supposed to be dual fiber. The Classic HD product listed in the upfront docs on page 14, Unit pricing 4, is our upgrade slit film system, not a dual fiber. It should be listed as Vertex -57 (2 1/4")?

**Answer 1:** Unit Pricing 4 changed to Vertex – 57 (2-1/4"). See Revised Section 300 in the Specifications.

**Question 2:** After reviewing the Landscape print that shows the quick coupling system, it came to my attention in the "notes" that if you had any questions regarding the existing system to contact American Sprinkler? Well, that's me, and we are bidding this as well. The number on there is for one of my employees who handles all of WSU sites. He shouldn't be answering irrigation questions from competitive bidders and is a conflict of interest. What shall we do?

**Answer 2:** SmithGroup removed American Sprinkler from notes on plan sheets and issued Addendum 2 (sheets LP100 and CD100) Thursday October 3, 2019.

WSU is seeking Proposals from GCs only who can do the entire work. This was mentioned at the pre-bid meeting by our FPM Department. For those wishing to quote to a GC, which will handle the entire Project, simply refer to our website at: [http://forms.procurement.wayne.edu/Adv\\_bid/Adv\\_bid.html#construction](http://forms.procurement.wayne.edu/Adv_bid/Adv_bid.html#construction) for the Pre-bid Sign-In Sheet for those that attended the pre-proposal meeting.

**Question 3:** Is the soil remediation required as part of our base bid, or is this what you are considering "Unsatisfactory Soil" per unit price #7.

**Answer 3:** Contractor to assume all soil on site is clean. WSU is asking for an Unsatisfactory Soil unit price in case any Unsatisfactory Soil is discovered.

**Question 4:** Does the gage of the fencing refer to diameter of the steel core wire or the finish size of the coated wire?  
The fence schedule notes per sheet CS500:  
Perimeter fence **6 Ga.**, 2" mesh  
Perimeter fence at Net system **9 Ga.**, 1" mesh  
Top rail and bottom rail **1.75**

**Answer 4:** Diameter of the steel core wire PRIOR to the coating of the wire.

**Question 5:** What is the fence spec for the small amount of fence that is not around the perimeter of the field?

**Answer 5:** Same as Perimeter Fence – 6 Ga, 2" mesh

**Question 6:** Top rail and bottom rail will be either 1.66" or 1.9" o.d. **Please clarify**

**Answer 6:** Top rail to be 1.66" diameter

**Question 7:** The fence details do not specify the diameter of the line posts. 2.38" o.d. is typical for 6' tall fence. **Please confirm.**

**Answer 7:** Line Posts = 2.38" Diameter

**Question 8:** The fence notes indicate that a grounding system for the fence shall be provided and that all fence grounding shall meet the requirements of the current municipal code... Vendor does not think it will be possible to achieve this with vinyl coated fencing. **Please clarify.**

**Answer 8:** If required by local code, provide grounding wire attached to nearest chain link fence post every 150' entire perimeter of fence / netting system; however, the contractor would have to remove the fence coating wherever the ground conductor is attached to the fence post.

If not required by code, our electrical would recommend grounding the fence only if a live power line spanned the fence just in case the power line were to drop on the fence (in a storm or power pole hit by car, etc.).

The fact the fence is buried in the ground provides some level of grounding.

**Question 9:** There was discussion of transporting contaminated material to a Wayne State approved landfill, can we get a list of those landfills and also for bidding purposes how many yards of contaminated material should we budget in our bid?

**Answer 9:** Geotechnical report and Phase II report have been provided in the appendix of the specifications. WSU has giving no specific amount of contaminated materials. Contractor to assume that all material is clean. See contaminated soils landfills in case any are discovered during excavation.

Wayne State University OEHS has worked with the following facilities:

- Waste Management - Woodland Meadows Landfill
- Arbor Hills Landfill
- Carleton Farms Landfill (Republic)

WSU OEHS will need a waste analysis of a representative sample of soil. It requires TCLP, a report on the list of heavy metals found in that test, plus a PCB test, and a tox screen for organics potentially present in the sample. Upon receipt of this analysis, WSU OEHS will review and then submit a profile to any of the above-mentioned facilities you may select.

You may pay independently of WSU OEHS, but all manifests must be signed by an authorized WSU OEHS representative, and all copies of the manifests must be sent to the WSU Project Manager and OEHS Representative from the landfill, when they actually receive the disposed materials.

**Question 10:** Note 5 on the demo sheet says to "cap utility and fill with flowfill", are we not removing the storm pipe as shown?

**Answer 10:** Storm pipe to be removed as shown on plans CD100 (catch basin #12 to catch basin #1). Storm pipe (outlet pipe from catch basin #1) to be capped and filled with flowable fill as shown.

**Question 11:** Has the city looked at the plans to determine the permit and inspection fees, if not where can we find this dollar amount to include in our bid.

**Answer 11:** All permit and inspection fees are the responsibility of the contractor. A Soil Erosion and Sedimentation Control permit from Wayne County will be required. All other permits will be the responsibility of the contractor. At this time, no other permits are required. See Spec Section Permitting. Not anticipated that DWSD permit is required since the project is on University property.

**Question 12:** The Redmond Linden trees are called out as 6" caliper, just wanted to confirm that this is what the school is looking for.

**Answer 12:** Yes, Redmond Linden 6" caliper, as shown on plans (LP100).

**Question 13:** The due date is May 6, 2020 are we to include costs for all winter conditions and frost laws in our bid?

**Answer 13:** The schedule has accommodated for potential winter conditions based on prior year frost law lift dates. A pause in construction was planned for during the heavy winter months. Base bid should not include costs for winter conditions and frost laws. All bidders to provide a project schedule as part of their bid.

**Question 14:** Other than the 2" irrigation line with quick couplers, is there any other irrigation work we need to include in our bid?

**Answer 14:** The connection to the existing irrigation system and line adjacent to the walk/field with quick couplers is the entire scope of new irrigation work.

**IMPORTANT- This is an addendum which MUST be acknowledged on your bid form**

**We will require your lump sum proposals, vendor qualification questionnaire and your bid bond documents as a single PDF in your electronic submission.**

All questions concerning this project must be emailed to: **Robert Kuhn**, Procurement & Strategic Sourcing. Email: [ac6243@wayne.edu](mailto:ac6243@wayne.edu), and copy **Valerie Kreher, Sr. Buyer**, at [ab4889@wayne.edu](mailto:ab4889@wayne.edu).

**Do not contact either FP&M or the Design Firm directly as this may result in disqualification of your proposal.**

Thank you for interest shown in working with Wayne State University.

**Robert Kuhn**  
**Sr. Buyer**

CC: **Alycsa Valentine** (Project Manager), **Valerie Kreher, Sr. Buyer**, Attendee list.

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

The work under this section consists of constructing a drainage aggregate and turf base using crushed stone or crushed gravel. The work under this section shall provide a surface ready for constructing and supporting the Synthetic Turf.

- B. Related Requirements:

Applicable provisions of Division 1 govern work under this Section.

Related work specified elsewhere:

Section 03 30 00 – Cast In Place Concrete

Section 30 05 00 – Common Work Results for Exterior Work

Section 32 18 13 – Synthetic Turf

1.3 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
  - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
  - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Aggregate layer placed between the subgrade, and the concrete walks
- C. Field Base Stone (4G MODIFIED): Aggregate layer placed directly below synthetic turf
- D. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- E. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- F. Drainage Aggregate: Free draining aggregate used to help infiltrate storm water into the ground water.
- G. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

**1.4 REFERENCE STANDARDS**

American Society for Testing and Materials (ASTM):

- C88 Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
- C131 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- C136 Sieve Analysis of Fine and Coarse Aggregates
- D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
- D2922 Standard Test Method for Density of Soil and Soil aggregate in Place by Nuclear Methods
- D3017 Standard Test Method for Water Content of Soil and Rock in place by Nuclear Methods
- D3385 Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer
- D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods
- E329 Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

**1.5 QUALITY ASSURANCE**

The Contractor shall conduct sampling, testing, and analysis as required by this section and elsewhere in the Contract Documents either by retaining the services of an independent construction materials testing consultant or with internal certified testers. The materials testing personnel shall meet the requirements of ASTM E329.

The Contractor's construction materials testing personnel shall complete material testing as outlined in Table 32 11 23.33-1.

**Table 32 11 23.33 -1**

Material	Test Required	Test/Sample Frequency
Drainage Aggregate & Turf Base Aggregate	C136 Sieve Analysis of Fine and Coarse Aggregates (provide "D" values or each aggregate type as listed in equations below)	1 test/300 CY placed
Drainage Aggregate & Turf Base Aggregate	Material soundness testing based on a Magnesium Sulfate Soundness Loss after 4 cycles of 20% or less.	1 test/600 CY placed
Drainage Aggregate & Turf Base Aggregate	ASTM D2922, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods	1 test/5,000 square feet of installed subbase
Drainage Aggregate & Turf Base Aggregate	ASTM D3385, Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer	1 test/10,000 square feet of installed subbase

Test pad: The Contractor shall identify the source and provide sieve analysis of proposed drainage stone a minimum of three (3) weeks prior to proposed placement of stone. Construct a 15-foot by 30-foot test pad utilizing design Drainage Aggregate and Turf Base Aggregate section at quarry site or project site utilizing Drainage Aggregate and Turf Base Aggregate. Contractor shall coordinate review and acceptance of the test pad compaction and drainage and support characteristics by the Owner and AE.

Conformance Survey of In Place Sub-Base Aggregates: The Contractor shall pay for and perform a conformance survey by a licensed surveyor, before any placement of the synthetic turf, on a 20-foot grid over the finish stone of the entire playing field. Provide spot elevations, based on the established benchmark, at each grid intersection and at the intersection of the perimeter and the grid. Submit a drawing showing the results of the above survey. The drawing shall include the scaled grid and all spot elevations. Interpolate spot elevations as required to provide contours. AE will require three (3) working days to review survey. After review, the survey will be returned to Contractor with areas out of tolerance noted for correction. Contractor will be required to correct areas out of tolerance and certify that corrections have been made prior to turf installation.

**1.6 Tolerance for In Place Sub-Base Aggregates:**

Turf Base Aggregate elevations shall be verified using laser-operation survey instruments. Finish Grade must be within 1/4 of an inch plus or minus from the elevations shown on the plans. In addition, the finish stone shall be measured so that no point within the 25-foot grid deviates more than 1/2 of an inch from any other point within the 20-foot grid.

Stringline Test: Entire finished aggregate surface shall be tested with a 50' stringline for elevation conformance within 1/4 of an inch over the entire length of the string. Areas not in conformance will be marked and shall be corrected prior to turf installation.

**1.7 SUBMITTALS**

Provide copies of all material testing reports completed for the project within 48 hours of completing the individual tests. Along with each individual test result, provide a running spreadsheet of all individual test results.

**1.8 PROJECT/SITE CONDITIONS**

Work of this section shall not be executed when site conditions are detrimental to quality of work as determined by the Owner.

**1.9 SEQUENCING AND SCHEDULING**

Coordinate work of this section with all other work contained in the Contract Documents and with the Turf Installer.

PART 2 - PRODUCTS

2.1 GEOTEXTILE FABRICS

**GEOTEXTILE FABRIC**

Provide geotextile fabric in the areas designated on the Details. Geotextile fabric should conform to the following minimum specifications as shown in Table 32 11 23.33-2.

**Table 32 11 23.33 -2**

<b>Property</b>	<b>Test Method</b>	<b>Typical Values</b>
Grab Strength	ASTM D 4632	>80 lb.
Puncture Strength	ASTM D 4833	25 lb.
Burst Strength	ASTM D 3786	130 psi
Trapezoid Tear	ASTM D 4533	>25 lb.
Permeability	ASTM D 4491	0.1 cm/sec
Apparent Opening Size	ASTM D 4751	>#60 Sieve size
Permittivity	ASTM D 4491	>1.7 sec.

**2.2 DRAINAGE AGGREGATE**

Use materials as described below.

Drainage Aggregate to be placed over geo-textile filter fabric shall be a washed, crushed and screened gradation aggregate manufactured from crushed limestone rock meeting the following criteria in Table 32 11 23.33-3:

**Table 32 11 23.33 -3**

U.S. Standard Sieve Mesh	Allowable Range % Passing
2 inch (50 mm)	100%
1.5 inch (38 mm)	90%-100%
1 inch (25 mm)	75%-100%
3/4 inch (19 mm)	65%-95%
1/2 inch (12.5 mm)	55%-85%
3/8 inch (9.5 mm)	40%-75%
1/4 inch (6.3 mm)	25%-65%
US #4 (4.75 mm)	15%-40%
US #8 (2.36mm)	0%-40%
US #16 (1.18 mm)	0%-20%
US #30 (600 µm)	0%-10%
US #60 (250 µm)	0%-15%
US #100 (150 µm)	0%-8%
US #200 (75 µm)	0%-5%

This material must meet the following requirements for acceptance:

Using the standard structural stability equation:

$$D_{60}/D_{10} > 5 \text{ and } 1 < D_{30}^2/D_{10}(D_{60}) < 3$$

Permeability requirements for the Drainage Aggregate should be greater than 50 inches per hour.

**2.3 TURF BASE AGGREGATE**

Turf Base Aggregate stone to be placed over Drainage Aggregate shall be a washed, crushed, porous limestone sand product (100% fractured) meeting the following criteria in Table 32 11 23.33-4:

**Table 32 11 23.33 -4**

U.S. Standard Sieve Mesh	Allowable Range % Passing
1/2 inch (12.5 mm)	100%
3/8 inch (9.5 mm)	85%-100%
1/4 inch (6.3 mm)	75%-100%
US #4 (4.75 mm)	60%-90%
US #8 (2.36mm)	35%-75%
US #16 (1.18 mm)	10%-55%
US #30 (600 µm)	0%-40%
US #60 (250 µm)	0%-15%
US #100 (150 µm)	0%-8%
US #200 (75 µm)	0%-2%

This material must meet the following requirements for acceptance:

Using the standard structural stability equation:

$$D_{60}/D_{10} > 5 \text{ and } 1 < D_{30}^2/D_{10}(D_{60}) < 3$$

Permeability requirements for the Turf Base Aggregate should be greater than 14 inches per hour.

#### 2.4 SEPARATION OF DRAINAGE AGGREGATE AND TURF BASE AGGREGATE

The Drainage Aggregate and Turf Base Aggregate together shall meet the following criteria:

This material together must meet the following requirements for acceptance:

Using the standard bridging equation:

$$\frac{D_{85} \text{ of Turf Base Aggregate}}{D_{15} \text{ of Drainage Aggregate}} > 2 \quad \text{and} \quad 3 < \frac{D_{50} \text{ of Drainage Aggregate}}{D_{50} \text{ of Turf Base Aggregate}} < 6$$

Porosity requirements for both aggregates should be greater than 25%.

Soft limestone and shale materials are not suitable for Drainage Aggregate or Turf Base Aggregate. Questionable materials should be evaluated using a sulfate soundness test (ASTM C-88) and LA Abrasion Test (ASTM C-131). The drainage stone should meet both of the following stability requirements Table 32 11 23.33-5:

**Table 32 11 23.33 -5**

Test Method	Criteria
Sulfate Soundness (C-88)	Not to exceed 12% Loss
LA Abrasion (ASTM C-131)	Not to exceed 40

### PART 3 - EXECUTION

#### 3.1 CONSTRUCTION

##### 3.2 PREPARING THE FOUNDATION

Refer to Section 31 22 16.17 – Athletic Field Subgrade Preparation.

Verify that area is ready to receive work, and excavations, dimensions, and elevations are as indicated on Drawings.

Using laser operation survey instruments, the Contractor shall verify that sub-grade has been prepared according to specification with regard to compaction, grade tolerances and is free of debris prior to beginning work.

Beginning of installation means acceptance of existing conditions.

##### 3.3 PROTECTION OF WORK IN PROGRESS

It is the responsibility of the Contractor to protect all work in progress from damage due to extremes of cold, moisture, or drying, or mechanical damage from equipment traffic or foot traffic. Alert the AE to the presence or likelihood of conditions that may adversely affect the quality of the work, the physical structure of soils, or transport of site soils off-site.

Do not work frozen soils.

Do not operate heavy equipment near excavations where trench wall or cut-slope failure may result.

##### 3.4 PLACING GEOTEXTILE FABRIC

**Install geotextile over the entire subgrade surface without wrinkles, folds, or excessive tension. Anchor ends and long runs with materials specified for installation above the geotextile, typically Base drainage stone. Do not anchor fabric with soil.**



### 3.5 DEFINITIONS:

**Course:** completed installation of fabric across the width of the finished field surface.

**Longitudinal Seam(s):** Seams created which run in the longest parallel axis of the finished field surface, within a single installed course of fabric.

**Transverse Seam(s):** Seams running across the width of the finished field surface, between courses.

**Install geotextile fabric as indicated on drawings per manufacturer's specifications and recommendations. Overlap lower gradient fabric seams with 24" of upper gradient fabric panels. Pin in place to prevent displacement.**

### 3.6 PLACING DRAINAGE AGGREGATE

Protect the approved work as installation of sub-grade is commenced and completed.

Prior to commencing the base drainage stone, confirm that geotextile has been approved by the AE as satisfactorily installed.

Do not operate machinery directly on approved Geotextile.

Use standard compaction conforming to WisDOT Section 301.3.4.2 of the SSHSC, unless otherwise specified herein. Final shaping of shoulder foreslopes does not require compaction.

Construct the drainage aggregate and turf base aggregate to the width and section the drawings show. Shape, and compact the base surface to within 0.04 feet of the drawing elevation.

Ensure there is adequate moisture in the aggregate during placing, shaping, and compacting to prevent segregation and achieve adequate compaction. Moisture condition drainage aggregate and turf base aggregate as necessary to achieve required density as determined by ASTM D1557.

Excavation shall be reasonably free of water prior to placement. Do not place drainage aggregate or turf base aggregate on frozen surfaces or use frozen material.

Maintain the base until synthetic turf installation commences, or until the UWEC Project Representative accepts the work.

Base drainage stone throughout the field shall be carefully smoothed and compacted. The entire playing field surface shall then be checked for irregularities and adjusted to a uniform grade per the grading plans.

### 3.7 COMPACTION

If using a pneumatic roller, do not exceed a compacted thickness of 6 inches per layer. For the first layer placed over a loose sandy subgrade, the Contractor may, with A/E approval, increase the compacted layer thickness to 8 inches. If using a vibratory roller, do not exceed a compacted thickness of 8 inches per layer.

The material shall be compacted to meet the following:

Test Method to determine maximum density and moisture	ASTM D1557
Relative compaction relative to the optimum	95%
Moisture content relative to the optimum	-2% to +2%

The compacted material shall be tested for in-place field density in accordance with this Section, Part I, Quality Assurance.

### **3.8 CONFORMANCE VERIFICATION**

The Contractor shall submit to the AE for review, the sub-base conformance survey, performed by a licensed surveyor, before any placement of the turf, on a 20-foot grid over the sub-grade of the entire playing field.

Turf Base Aggregate elevations shall be verified using laser-operation survey instruments. Finish Grade must be within 1/4 of an inch plus or minus from the elevations shown on the plans. In addition, the Turf Base Aggregate shall be measured so that no point within the 20-foot grid deviates more than 1/2 of an inch from any other point within the 20-foot grid.

After review, the conformance survey will be returned to Contractor with areas out of tolerance noted for correction. Contractor will be required to correct areas out of tolerance and certify that corrections have been made prior to turf installation. Areas that deviate should be marked with spray paint and corrected by re-grading or filling low areas with turf base aggregate to achieve proper density.

### **3.9 EXAMINATION OF THE BASE BY THE SYNTHETIC TURF INSTALLATION SUPERVISOR**

The Turf Installation Supervisor shall verify that all sub-base, drainage and leveling is complete prior to installation and that the sub-base meets all tolerance-to-grade requirements.

The surface to receive the synthetic turf shall be inspected by the Installer, and prior to the beginning of installation, the Installer must accept in writing the sub-base surface planarity. The surface must be perfectly clean as installation commences and shall be maintained in that condition throughout the process.

Confirm the compaction of the turf base aggregate.

Confirm by on-site inspection and testing that the sub-base is acceptably permeable.

### **3.10 CLEANUP**

After the project is completed, thoroughly clean up all debris which may have accumulated during the placement of drainage aggregate, turf base aggregate and breaker run, if placed. All storm sewer manholes, inlets, underdrains and trench drains within the project area shall be inspected in the presence of the UWEC Project Representation, the Owner Agency, and the A/E to confirm there is no accumulated debris. The Contractor shall ensure the manholes, inlets, underdrains and trench drains are free of water and debris prior to inspection by the parties noted above. Any accumulated debris in the manholes, inlets, underdrains and trench drains shall be removed and properly disposed of by the Contractor.

Replace or repair as required, all surfaces and/or landscape features damaged or disturbed under this item of work.

END OF SECTION

SECTION 321813 - SYNTHETIC TURF

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes all materials, labor and equipment for installation of synthetic turf and base as indicated on drawings.
- A. Perimeter edge details required for the synthetic turf shall be as detailed and recommended in these plans and specifications'.
- B. Scope of work: The general extent of the work and project limits is shown on the Drawings and can include, but may not be limited to the following.**
  - 1. Provide an inspection and certification of subsurface drainage system and free draining subbase prior to commencement of subsequent work.**
  - 2. Furnish and install Synthetic Turf Athletic Surface complete with field markings and logos, inlaid lines and numbers as required including resilient underlayment where applicable, and resilient infill mix.**
  - 3. Provide attachment methods for field openings and perimeter conditions.**
  - 4. Provide post construction field maintenance instructions, field maintenance training and product warrantee.**
  - 5. Furnish attic stock.**

1.3 REGULATORY REQUIREMENTS AND REFERENCES

- A. Regulatory requirements and references follow the current guidelines set forth by the various governing bodies listed below. Unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable. Where discrepancies are noted between these various governing bodies, the rules of the NCAA shall be enforced.
  - 1. American Society for Testing and Materials (ASTM)**
  - 2. Consumer Products Safety Commission (CPSC)**
  - 3. International Amateur Athletic Federation (IAAF)**
  - 4. National Collegiate Athletic Association (NCAA)**

**1.4 QUALITY ASSURANCE**

**A. Synthetic Turf Surface Provider:** Synthetic turf athletic surface shall be provided by an experienced vendor, manufacturer or provider which shall have supplied a minimum of five (5) NCAA Division I synthetic turf athletic surfaces of 50,000 square feet or greater within the last five (5) years and one (1) installation of the product in the State of Michigan. Provide a written description of each facility including name, address, date installed and phone number of Owner's Representative.

**B. Synthetic Turf Surface Installer:** Synthetic turf surface installation shall be provided by an experienced contractor which shall have installed a minimum of five (5) NCAA synthetic turf athletic surfaces of the type specified of 50,000 square feet or greater within the last five (5) years. Provide a written description of each facility including name, address, date installed and phone number of Owner's Representative

**D. The synthetic turf surface installation crew whether subcontracted or employed by the turf company shall have the following competent workmen skilled in this specific type of synthetic grass installation on site daily during the entire installation.**

**1. One lead installer onsite who has installed a minimum of twenty (20) synthetic turf athletic surfaces of the type specified of 50,000 square feet or greater.**

**2. Two additional crew members onsite which shall have individually installed a minimum of eight (8) synthetic turf athletic surfaces of the type specified of 50,000 square feet or greater.**

**3. The installation crew personnel qualifications shall include the individual's resume, project list and contact information (cell phone) to allow the owners representatives the opportunity to verify employment and or subcontractor status at any time leading up to and during the installation of the project. Substitution of installation crew personnel shall be approved by the Owner's Representation and shall meet the minimum qualifications specified above.**

**4. At any time after the award of the contract and before the completion of the project, should any member of the approved installation crew or subcontractor discontinue their relationship with the synthetic turf installation contractor or turf provider the Owners Representative must be immediately notified. Failure to provide installation crew personnel meeting the minimum qualifications shall be considered a default of the contract requirements.**

**5. The designated Supervisory Personnel on the project must be certified, in writing by the Synthetic Turf Provider, as competent in the installation of this synthetic surface, including sewing seams and proper installation of the infill mixture.**

**6. The Synthetic Turf Provider shall have a representative on site to certify the installation and Warranty compliance.**

**E. Source Limitations:** Obtain synthetic turf surface including turf yarn, carpet backing, resilient underlayment and infill from a single manufacturer or supplier. Provide additional components including anchoring materials, seaming products, binders, adhesives from single sources.

**F. The synthetic turf provider and installation contractor shall inspect the sub-base and provide written approval and acceptance of the sub-base before the installation of the synthetic turf surfacing material. The synthetic turf provider shall provide a certification that the sub-base construction does not void any provision of the product warrantee. Commencement of work indicates acceptance of underlying substrates.**

**G. Quality assurance testing for in place system performance shall include the following:**

1. **In-place G-max rating of the synthetic turf system per ASTM F355 & F1936, Standard Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials, Test Method A. System G-max rating shall not be less than 70 nor exceed 130 at installation. System shall not exceed a G-Max rating of 145 during the warranty period. Specify G-max test locations, such as centerline of playing field and other areas subject to more usage, environmental conditions during the test, and other subjective parameters that might significantly affect the test results.**
2. **The Synthetic Turf Surface Provider shall provide two separate G-max tests one at field acceptance, and another prior to the end of the one year guarantee. Testing shall be performed by an independent, third party testing firm that has no manufacturer related ties or sponsorship.**
3. **Percolation testing: Infiltration testing per ASTM D3385, Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer, for each 20,000 square feet of installed synthetic turf surface, or other equivalent percolation test.**
4. **Conformance Survey of Infill Materials (where applicable): The Owner's Representative shall perform a conformance survey on a 20-foot grid over the finish surface of the entire playing field using a dial gauge. After review, the survey will be returned to Contractor with areas out of tolerance noted for correction. Contractor will be required to correct areas out of tolerance and certify that corrections have been made prior to final acceptance. Tolerance for Infill Materials shall be within 1/4 of an inch from the elevations shown on the plans.**

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver manufactured materials in original packages with seals unbroken and bearing manufacturer's labels indicating brand name and directions for storing.
- B. Store manufactured materials in a clean, dry location, protected from the weather and deterioration, and complying with manufacturer's written instructions for minimum and
- C. Maximum temperature requirements for storage.
- D. Store units on flat surfaces.
- E. Protect UV-light sensitive materials from exposure to sunlight.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply surface system materials or components over wet, frozen, or excessively damp substrates if prohibited by manufacturer's written instructions or warranty requirements.
- B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit playground surface system to be performed according to manufacturer's written dimensions of other construction by field measurements.

1.7 WARRANTY

- A. The Contractor shall provide its Manufacturer's Warranty which guarantees the usability and playability of the synthetic turf system for its intended use. The warranty coverage shall not be prorated nor limited to the amount of the usage.
- B. The warranty must have the following characteristics:
  1. Must provide full coverage for eight (8) years from the date of Substantial Completion
  2. Must warranty materials and workmanship.

3. Must warrant that the materials installed meet or exceed the product specifications.
4. Must have a provision to either make a cash refund or repair or replace such portions of the installed materials that are no longer a serviceable as a playable surface.
5. Manufacturer's warranty shall be supported by a third-party insurance policy for the full eight (8) year period. The insurance policy shall be pre-paid, direct with the owner, and non pro-rated. The insurance policy shall cover full labor and material replacement of the entire system including backing, fibers, infill, seams, inlays, adhesives, and nailer boards.
6. Guarantee the availability of replacement material for the synthetic turf system installed for the full warranty period.

1.8 SUBMITTALS

**A. *Proposal Submittals:*** Submittals will be used as a basis to verify product quality, performance, and installation procedures. Along with the proposal submission, Contractor shall submit the following:

1. Provide Bidder Qualifications of the Synthetic Turf Surface Provider, Installation Contractor and Installation Crew Personnel according to the Proposer's Statement of Qualifications (PSQ) documents.
2. Provide one (1) square foot assembled sample of selected turf product along with component samples of infill material, as a part of Bid submission.
3. Provide an analysis and representation of the resilient infill material and resilient underlayment composition including compliance with EN71-3 chemical test compliance.
4. Provide complete description and documentation that selected system meets or exceeds all performance criteria contained in this specification.
5. Warranty information and details for the system being proposed.
6. Shop Drawings:
  - a. Submit shop drawings for the synthetic turf surface including edge details, field openings, penetrations, sections and accessories.
  - b. Provide an underlayment and seaming plan at 1"=20'-0"
  - c. Provide a field marking and dimensioning plan which includes field lines, boundaries, numbers, hashes, ticks, logos and other field markings in compliance by the regulatory sports agency and the drawings.
  - d. Provide color samples of manufacturer's standard fiber for approval.
  - e. Provide one quart samples of sand and infill materials along with material sieve analysis.
7. Submit certified copies of independent laboratory reports on ASTM tests as follows for the synthetic grass carpet:
  - a. Pile Height, Face Width and Total Fabric Weight, Primary & Secondary Backing Weights, ASTM D418 or D418 or D5848
  - b. Tuft Bind, ASTM D1335.
  - c. Grab Tear Strength, ASTM D1682 or D5034
  - d. Pill Burn Test, ASTM D2859.
  - e. Impact Attenuation, Gmax < 130 at installation ASTM F355 and F1936
  - f. Permeability, ASTM D4491
  - g. Cycle Test (Roll Stud) 20,000 cycles (Labosport or approved equal)
  - h. Toxicity Product testing on the European Standard EN 71-3 or equivalent US testing for infill materials and resilient underlayment.

**B. *Pre-Construction Submittals:*** Prior to construction, Contractor shall submit the following

1. Provide documentation as to sources of component materials and related characteristics.
2. Provide written approval and acceptance of the sub-base before the installation of the synthetic turf surfacing material by both the synthetic turf provider and installation contractor.
3. Provide certification that the sub-base construction does not void any provision of the product warrantee.
4. Provide MSDS sheets, equipment warranties and manufacturer information for all materials or components required in this specification.

5. Provide construction schedule and a schedule of values for each construction component.
6. Provide written product warranties and third party insurance policies (where applicable) by the synthetic turf surface provider.
7. Project Management Plan
8. Sample of stainless steel post for bases, provide submittal

**Samples:**

- a. Provide the following 12" x 24" assembled samples of the specified synthetic turf surface products:
  - b. Sample of resilient underlayment system
  - c. Green carpet to green carpet secured with a glued seamed
  - d. Green carpet with a four inch white tufted line
  - e. Green carpet to green carpet secured with sewn/glued seam
- C. **Testing During Construction:** Contractor shall submit the following during construction:
  1. Certification: Submit certification signed by Contractor that installed materials conform to specified requirements and the synthetic turf base was successfully checked and tested prior to covering with carpet.
  2. Synthetic turf manufacturing process random sampling test results.
  3. Conformance Survey of Infill Materials.
- D. **Post Construction Submittals:** Contractor shall submit the following prior to project closeout:
  1. Infiltration testing per ASTM D3385, Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer.
  2. In-place G-max rating of the synthetic turf system per ASTM F355 & F1936.
  3. Record Drawings: Accurately record location of new piping, drain structures, and connections to existing systems using horizontal dimensions, elevations, inverts and slope gradients as applicable. Maintain progress drawings on the construction site at all times. Make a daily record of all work installed each day until completion of the work.
  4. Operational and Maintenance Data: Submit manufacturer's data in a three ring binder, labeled and indexed. Describe maintenance procedures, required equipment and projected manpower to accomplish required maintenance procedures. Include requirements for replacement of infill materials and procedures for painting temporary markings.
  5. Provide statements and documentation for surface cleaning factors and maintenance protocols for fluid spills, animal waste, pathogens, vandalism, food and debris.

**1.9 DELIVERY STORAGE AND HANDLING**

- A. Provide for delivery of all materials required to complete the work of this section. Store all materials in such a manner as to prevent ground contact or exposure to sun, wind, or rain. Pay particular attention to maintaining infill materials as dry and flowable. Handle all materials in accordance with the manufacturer's recommendations or requirements for maintenance of the requirements of warranty. The installation contractor shall coordinate storage of products on-site in an orderly manner not to impede the work or reasonable use of the project site.
- B. Deliver materials in original, unopened containers with original labels intact and legible, which state the guaranteed analysis.

**1.10 PROJECT CONDITIONS**

- A. Comply with the environmental protection and safety requirements of the Owner and all governmental authorities having jurisdiction.
- B. Synthetic turf installation operations shall not be conducted under the following conditions unless approved by Owner's Representative:
  1. Ambient air and material temperatures are at least 40 degrees F and rising.
  2. High winds
  3. Excessively wet conditions. Surfaces and materials shall be dry. Adhesives should not be applied within 12 hours after rainfall, or when rainfall is eminent.
  4. Conditions exist, or are pending, that will be unsuitable for the installation of the system as set forth by the manufacturer.

- C. **Construction Surveying:** The Contractor shall be responsible for all construction surveying required for the proper layout and location of all work covered hereunder.

Avoid contamination of materials during construction and installation of synthetic turf field.

#### 1.11 WARRANTIES

- A. The Contractor shall submit documentation of its full term Manufacturer's Warranty and proof of a third party insurer (where applicable) which guarantees usability and playability, on a non-prorated basis. Warranty will cover all materials, workmanship, and entire synthetic turf surface performance.
- B. The Contractor warrants that during the period of the warranty that all materials and components, and the installed system meets or exceeds the product and performance specifications set forth herein.
- C. The turf shall not fade in that the synthetic turf material shall remain a uniform color with no significant loss of color during the warranty period.
- D. The length and weight of the face yarn or pile shall not have been decreased by more than 10% per year according to ASTM D418, nor exceed 50% during the warranty period.
- E. Synthetic turf system G-max values for all points of sampling or testing, as determined and set forth using the ASTM F355 & F1936 protocol and additional requirements of the warranty, shall be 70 – 130 G-max upon installation and shall not exceed 145 G-max during the warranty period. Any increase shall not exceed 5% in any single year.
- F. The exposed fiber will not wear excessively as represented by a loss of more the 5% per year of the exposed fiber (fiber above the infill).
- G. Fabric seams shall remain attached and shall not separate or become unattached.
- H. The synthetic turf surface shall drain vertically a minimum of 15" per hour without prolonged accumulation of surface water. Remediation of the impaired drainage must be approved by the Owner.
- I. The artificial turf system shall be in strict compliance with the recommended installation standards for infill height and free pile height as required by the fiber/yarn manufacturers.
  - 1. The maximum recommended free pile height (fibers showing over the infill as required by the yarn manufacturer) needs to be maintain over the life of warranty and the settling of the infill material needs to be factored into the installation process to comply with the yarn manufacturer's warranty.
  - 2. If the field is found to have settled to a point lower than the recommended amount for "Free Pile Height" at any time during the warrantee the field will be classified as noncompliant and the provider must make remediation by adding additional infill material with a maximum of 5 month from the date of notice.
  - 3. A copy of the yarn manufacturer's warranty must be provided showing all terms, condition, exclusions and limitations on the product and circumstances that can void the warranty.
  - 4. The warranty being provided to the owner by the successful bidder/turf company must reflect the same base minimum guidelines recommended by the yarn/fiber manufacturer. The warranty may be more restrictive but cannot fall below the minimum standard of the yarn manufacturer.



PART 2 - PRODUCTS

2.1 SYNTHETIC TURF FIELD DESCRIPTION

- A. A synthetic turf carpet (with a shock pad as required by the manufacturer) consisting of a PE (polyethylene) or nylon fiber tufted or knitted into a permeable double-layered primary backing with a secondary backing as shown on the drawings. Synthetic Turf Athletic Surface shall be specifically designed and recommended for athletic use.
- B. Infill systems shall be comprised of resilient infill materials and mixed silica sand. The infill material fills the voids between the fibers allowing the fibers to remain vertical and non-directional.
- C. Synthetic Turf Rolls shall be a minimum of 15' feet wide. Rolls shall be of sufficient length (1' min. Overage) to cover from sideline to sideline without head seams.

2.2 SYNTHETIC INFILLED TURF SYSTEM

- A. The synthetic infilled turf surface shall consist of monofilament or parallel cut polyethylene fibers or nylon fibers tufted into a primary backing with a secondary backing. The synthetic infilled turf carpet shall meet the following requirements.

Property	Standard	Specification
Pile Yarn Type	PE	Thiolon XP Pro, Extruded Monofilament or Equal
Fiber Denier	ASTM D1577	≥ 11000 nominal
Pile Height	ASTM D418/D5848	2.00 inches nominal
Pile Weight	ASTM D418/D5848	>35 oz./sq. yd.
Primary Backing		Thiobac C08 Pro or Equal
Primary Backing Weight	ASTM D418/D5848	>7.75 oz/sq. yd.
Secondary Backing		Polyurethane
Secondary Backing Weight	ASTM D418/D5848	>25 oz/sq. yd.
Tuft Bind	ASTM D1335	>10 lbs. (without infill)
Total Carpet Weight	ASTM D5848	>65 oz/sq. yd.
Grab Tear (length)	ASTM D1682/D5034	250 lbs/force
Elongation To Break	ASTM D2256	>50%
Yarn Breaking Strength	ASTM D2256	>20 lbs. to break
Carpet Permeability	ASTM D4491	>20 inches/hour
Impact Attenuation, G-max	ASTM F355/F1936	=<130 at installation =<145 over field life
Relative Abrasiveness	ASTM F1015	> 20
Water Permeability	ASTM F1551	> 15" / hr.
Pill Burn Test	ASTM D2859	Pass
Cycle Test (Roll Stud)	Labosport or approved equal	20,000 Cycles or more prior to showing wear on fibers.

- B. Certificate attesting that the Synthetic Turf Manufacturer meets the requirements of ISO 9001:2008 and ISO 14001.

**2.3 RESILIANIT INFILL MATERIALS**

- A. Resilient infill materials shall be uniformly filled to a depth which meets the system specification after settlement, and consist of a homogeneous mixture meeting the following criteria.**

Property	Standard	Specification
Granule Composition		Virgin EPDM
Sieve Analysis	ASTM D5644	0.8 mm – 2.4 mm #18 sieve: 100% passing #35 sieve: <80% passing #50 sieve: <0.5% passing
Quantity		Must meet system specifications
Sand Granules Shape	ASTM D442	Angular & sub-angular particles are not acceptable
Sand Sieve Analysis	ASTM E11	#16 sieve: 100% passing #30 sieve: <80% passing #50 sieve: <0.5% passing
Sand Quantity		Must meet system specifications
Hardness		=7.0 Mohs
Moisture Content	ASTM C566	<0.1%
Specific Gravity	ASTM C128	2.65 g/cm <sup>3</sup>
Total Infill weight	ASTM D5848	Must meet system specifications
Depth of Infill		Depth from top of infill to surface of fabric Must meet system specifications
Toxicity	European Standard EN 71-3	Pass
Tolerance of infill depth		.25 in
Pill Burn Test	ASTM D2859	Pass (as installed)

**2.4 MISCELLANEOUS MATERIALS**

- A. Seaming Tape:** Tape for securing inlaid lines and reference tick marks in the tufted synthetic turf surfaces shall be high quality seam tape made especially for artificial turf applications with a minimum width of 15” inches.
- B. Adhesives:** Adhesives for bonding tufted artificial turf shall be hot melt or a one part moisture cured polyurethane obtained from a single manufacturer and be equivalent to Nordot 34-G as manufactured by Synthetic Surfaces, Scotch Plains, NJ (908) 233-6803 or approved equal. The adhesive shall be amended per the manufacturer specification during adverse weather conditions.
- C. Perimeter Edge:** The method for attaching to the edge of the synthetic turf shall be hidden, stable, non-degradable, and not visible when construction is complete as recommended by the Synthetic Turf Provider. All edge conditions must be addressed, including where the synthetic turf abuts skinned infield, paved areas, or concrete conditions.
- 1.** The perimeter edge details required for the synthetic turf shall be as detailed and recommended by the Turf Provider, and as approved by the Owner. Supply and installation of

these details will be under the scope of work of the base contractor (see Section 32 11 23.35-Athletic Field Base), not that of the Synthetic Turf Installer.

## 2.5 SYNTHETIC TURF

- A. Contractor shall provide a total of (6) six sperate prices for synthetic turf systems.
1. See Section 00 43 22 UNIT PRICES FORM – Section 1.3. Contractor shall enter overall synthetic turf system number on line provided and enter a price per Square Foot cost for each system for evaluation by the University. Contractor to INCLUDE their lowest synthetic turf price in their overall bid.
- B. Contractor shall provide (3) three bids on the following turf systems:
1. Base Bid:
- a. 2-1/4" pile
  - b. Minimum 6 pounds total infill weight (1.5 pounds to 3 pounds sand minimum)
  - c. ~~Must not exceed 165 GMAX for life of the field, 8 year warranty.~~
  - d. FieldTurf: Field Turf XT-57
  - e. AstroTurf: Rhino 42
  - f. Shaw: Momentum SD
- C. Contractor shall provide (3) three bids on the following turf systems:
1. Alternate Bid:
- a. 2-1/4" pile height
  - b. Total infill weight (1.5 pounds to 3 pounds sand minimum – 70% rubber to 30% silica sand) to achieve GMAX and safety standards for warranty period of field
  - c. ~~Must not exceed 165 GMAX for life of the field, 8 year warranty.~~
  - d. **FieldTurf: FieldTurf Vertex-57 2-1/4" Duel Fiber**
  - e. AstroTurf: Rootzone 3D3 Blend 52 – 2" fiber
  - f. Shaw: Legion 2" – Duel Fiber
- D. Grooming Equipment
1. No grooming equipment to be included as part of the base bid or alternate bid. Wayne State University will use existing grooming equipment.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. The installation shall be performed in full compliance with approved shop drawings.

- B. All installation operations shall be performed by personnel directly employed by the manufacturer, full 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. Installation supervisors shall have a minimum of five (5) years experience.
- C. The surface to receive the synthetic turf shall be inspected and certified by the manufacturer as ready for the installation of the synthetic turf system. Contact Landscape Architect to schedule on-site meeting.
- D. Adhesives for bonding knitted synthetic turf appropriately shall be as recommended by the synthetic turf manufacturer.
- E. Cord for sewing seams of the turf shall be as recommended by the synthetic turf manufacturer.

### 3.2 BASE STONE CONSTRUCTION

- A. The base stone slope gradation and direction shall match subgrade slope, unless otherwise noted.
  - 1. The geotextile fabric shall be installed under the stone base.
  - 2. The drain system shall be installed as indicated on the drawings.
  - 3. The base stone shall consist of open graded aggregate. The open graded aggregate material must be free draining consistent with the vertical draining requirements of the turf manufacturer.
  - 4. The finished grade of the base stone shall not vary more than 1/4" when compared with a 50' taut string line. Any imperfections, divots, etc in the base stone will be repaired by the contractor and re-evaluated.

### 3.3 INSTALLATION OF SYNTHETIC TURF SURFACE

- A Installation of synthetic turf to be completed by qualified personnel approved by manufacturer, meeting the qualifications standards set forth in this document. All installation work shall be done in strict accordance with the manufacturer's current installation instructions and approved design documents for this project.**
  - B In the event of damage, immediately make all repairs and replacements necessary to the approval of the Owner and Owner's Representative at no additional cost to the Owner.**
  - C. The contractor shall verify subgrade compaction and elevation conditions will be adequate to achieve field performance.**
  - D. Conformance with building codes: System shall meet applicable codes and ordinances.**
- ~~A. The turf installer shall thoroughly inspect all materials delivered to the site both for quality and quantity to assure that the entire installation shall have sufficient material to maintain proper mixing ratios.~~
- ~~B. Synthetic turf shall be loose laid across the field, stretched, and attached to the perimeter edge detail. Turf shall be of sufficient length to permit full cross field installation. No head or cross seams will be allowed except as needed for inlaid fabric striping or to accommodate programmed cut-outs.~~
- ~~C. All seams shall be flat, tight, and permanent with no separation or fraying. Field seams shall be sewn using double lock stitch with cord recommended by the turf manufacturer. Seaming tape is to be constructed of high tenacity polyurethane coated, woven nylon. Inlaid markings shall be adhered to the seaming tape with a two part, high strength polyurethane adhesive applied per the turf manufacturer's standard procedures for outdoor applications. All seams shall be transverse to the field direction; i.e., run perpendicularly across the field.~~

- ~~D. Prior to infill installation, Landscape Architect shall conduct a pre fill inspection for the purpose of verifying striping seaming and other requirements. Infill materials shall be properly applied in numerous lifts using special broadcasting equipment to produce a layered system of the manufacturer's standard infill products composed of a minimum 30% silica sand and maximum of 70% crumb rubber by weight. The turf shall be raked and brushed properly as the mixture is applied. The infill material shall be installed to a depth of 1 3/4 inches. The infill materials can only be applied when the turf fabric is bone dry.~~
- A. Verify that area is ready to receive work, and excavations, dimensions, and elevations are as indicated on Drawings.
- B. Beginning of installation means acceptance of existing conditions.

### 3.4 SYNTHETIC TURF CARPET

- A. After acceptance of the shock absorbing pad, the carpet is to be laid out on the site and consecutive panels to be sewn together at the seams using procedures approved by the manufacturer.
- B. Protect finished shock pad installation from disturbance.
- C. Note climatic conditions during placement of individual segments of carpet materials. Make allowances for heat and cold as necessary to provide uniform elongation and tension.
- D. Lay carpet uniformly smooth throughout, with no wrinkles, folds, or overly tight areas.
- E. Any carpet panels exhibiting yarn or fiber from different dye lots which result in a discernable visible appearance shall be rejected.
- F. Any carpet panels exhibiting tufting, yarn or secondary coating defects in excess of 5% which in the Owner's Representative's opinion would impair bonding of adhesives, vertical drainage, stability of yarn or degrades the performance of the turf surface shall be rejected.

### 3.5 BONDING OF MATERIAL SURFACES

- A. The adhesive bonding of all system material components shall provide a permanent, tight, and secure and hazard free athletic playing surface. The following components, at a minimum, shall meet this requirement. Bonding of:
1. Shock absorbing pad to the base material (if required)
  2. Turf to pad
  3. Turf to seam tape (if tape is used)
  4. All turf to terminal edges
- B. The bonding design and work shall be such that all surface joint and seams shall remain as required throughout the warranty period as a minimum.

### 3.6 SEAM CONSTRUCTION

- A. Edges and seams are to be constructed in strict accordance with manufacturer's instructions
- B. The synthetic turf surface shall be installed using sewing techniques for the main seams and glue or hot melt for the inlays. All sewn seams shall be done with high strength durable outdoor cord routinely used for synthetic turf surfaces. Seams shall be indiscernible at the completion of the installation. Shearing of fiber or yarn to achieve a uniform system height must be approved by the owner's representative.
- C. All seams widths are to be the absolute minimum and as approved. All seams (butt joints) shall be traverse to the field direction of play. No head seams are allowed on the playing surface. All lateral seams (if sewn) are to be sewn with a reinforced lock stitch.
- D. Seams shall be sown or glued so that the exposed primary backing does not exceed 3/4" maximum
- E. Remove fibers from the stitch line prior to sewing the carpet panels.

### 3.7 FIELD MARKINGS

- A. Field marking, lines, yard line numbers, hashes and logos shall be as approved by owner prior to fabrication and installation. The Owner reserves the right to reject any turf panels not properly tufted in accordance with the seaming plan.
- B. Field of play perimeter lines and field lines shall be tufted into the turf carpet as shown on the plans. Numbers logos and hash markings are to be inlaid prior to insertion of the infill.
- C. All inlays (lines, numbers, letters, hash marks and logos) must be reinforced with a mechanical attachment such as hand sewing to secure the corners and edges down to the seaming tape or primary backing. This process is in addition to the adhesive process of securing the inlays.
- D. All synthetic turf carpet used for field marking must be the same yarn, type and height.
- E. Under no circumstances will inlays or repairs of less than 4 inches in width be allowed.

### 3.8 RESILIENT IN-FILL MATERIALS

- A. The infill materials is to be approved by the manufacturer, and shall be inserted according to the manufacturer's approved procedures by qualified installers.
- B. Precisely blend the infill materials to obtain a homogeneous mix (as required).
- C. Install and compact the infill materials so that the infill is settled and will meet the system specifications throughout the warranty.

### 3.9 MAINTENANCE EQUIPMENT AND MATERIAL STOCKPILE

- A. Stockpile the following additional materials for Owner's future use at an on-site location to be determined.
- B. Arrangements to be made for the Owner to purchase additional quantities of the infill mixture for addition to the field if and when the need arise.
- C. The Synthetic Turf Provider will provide the following additional material:
  - 1. Twenty (25) linear feet of one (1) normal roll width to the Owner surplus carpet for repairs caused by vandalism or acts not covered by the warranty.
  - 2. One (1) super-sack container of resilient infill materials.

### 3.10 RECORD DRAWINGS

- A. Maintain progress drawings on the construction site at all times during installation of the synthetic field system. Make a daily record of all work installed each day until completion of the work.

### OWNER'S INSTRUCTIONS

- A. The Synthetic Turf Provider shall instruct the Owner's maintenance staff on the care and maintenance of the synthetic turf surface.
- B. Notify Owner's Representative when instructions are to be given.
- C. Provide Five (5) complete maintenance manuals to be given to the Owner; one maintenance manual to be given to the Owner's Representative.
- D. Furnish Five (5) copies of manufacturer's literature, samples, certifications, or laboratory analytical data for all items submitted as a part of this specification.

### PROJECT CLOSEOUT

- A. Remove all debris, excess materials, etc. from site and leave work in clean, orderly and acceptable condition.
- B. Provide all submittals, quality assurance tests, manuals, equipment and warranties.
- C. One Year Inspection: The Owner's Representative shall perform a conformance survey on a 20-foot grid over the finish surface of the entire playing field using a dial gauge. After review, the survey will be returned to Synthetic Turf Installer with areas out of tolerance noted for correction. Synthetic

Turf Installer will be required to correct areas out of tolerance and certify that corrections have been made The Synthetic Turf provider shall conduct an ASTM-F355/F1936 impact test using an independent lab and provide the results to the Owner.

END OF SECTION