



ADDENDUM TO BID DOCUMENTS

Addendum No.	2
Project Name	CATA Stadium
Bid Number	6-97648067
Date	7/6/2026

I. PURPOSE OF ADDENDUM

The purpose of this addendum is to clarify addendum 1

ADDENDUM NO. 1

Date of Addendum: June 30, 2026

Project Name: CATA Track and Field Replacement

PROJECT INFORMATION

- A. Owner: Union County Public Schools
- B. Engineer: Timmons Group
- C. Engineer Project Number: 76043

NOTICE TO BIDDERS

- A. This Addendum serves to clarify, revise, and supersede information in the Project Manual and Drawings. Portions of the Addendum affecting the Contract Documents will be incorporated into the Contract by enumeration of the Addendum in the Owner/Contractor Agreement.

ATTACHMENTS

- B. Addendum No. 1 includes the following attached sheets dated June 30, 2026. Each Sheet is individually designated as new or revised/reissued:
 - 1. Pre-Bid Sign-In Sheet
 - 2. Pre-Bid Questions & Responses
 - 3. Spec Section 00 0000 – Civil Table of Contents; (revised/reissued)
 - 4. Spec Section 13 3416.53 – Bleachers; (revised/reissued)
 - 5. Spec Section 26 5668 – Exterior Athletic Lighting; (revised/reissued)
 - 6. Spec Section 27 7281 – Pressbox Sound System; (revised/reissued)
 - 7. Spec Section 32 1900 – Exterior Athletic Equipment; (newly issued)
 - 8. Spec Section 32 1823.19 – Synthetic Turf System; (revised/reissued)
 - 9. Civil Sheet C-400 – Notes and Details; (revised/reissued).
 - 10. Civil Sheet C-404 – Notes and Details; (revised/reissued).

REVISIONS TO DIVISION 00 PROCUREMENT AND CONTRACTING REQUIREMENTS

- 1. Spec Section 00 00 00 – Civil Table of Contents; (revised/reissued).

REVISIONS TO DIVISION 01 GENERAL REQUIREMENTS – NONE REQUIRED

REVISIONS TO DIVISIONS 02 - 49 SPECIFICATION SECTIONS

- Item 1.1 Add Spec Section 32 1900 – Exterior Athletic Equipment, included in the Attachments.
Revision: Added spec for exterior athletic equipment including scoreboards
- Item 1.2 Revised Spec Section 32 1823.19 – Synthetic Turf System, included in the Attachments.
Revision: Revised Base Stone depth to 4” to match plans.
- Item 1.3 Revised Spec Section 13 3416.53 – Bleachers, included in the Attachments.
Revision: Added approved manufacturers
- Item 1.4 Revised Spec Section 26 5668 – Exterior Athletic Lighting, included in the Attachments.
Revision: Changed specs and warranty period
- Item 1.5 Revised Spec Section 27 7281 – Pressbox Sound System, included in the Attachments.
Revision: Revised basis of design specs

ADDITIONAL ACCEPTABLE MANUFACTURERS

- 1) E&D Specialty Stands, Inc – Bleacher and Press Box
- 2) Southeastern Seating, Inc. – Bleacher and Press Box
- 3) Bleachers International – Bleacher and Press Box
- 4) Premier Sports Lighting – Exterior Athletic Lighting

REVISIONS TO DRAWING SHEETS

- Item 1.1 Replace SHEET C-400 – NOTES & DETAILS with revised SHEET C-400 – NOTES & DETAILS, included in the Attachments.
Revision: Adjusted long jump and triple jump detail dimensions
- Item 1.2 Replace SHEET C-404 – NOTES & DETAILS with revised SHEET C-400 – NOTES & DETAILS, included in the Attachments.
Revision: Revised synthetic turf depth dimension

END OF ADDENDUM NO. 1

Prebid Meeting Sign in Sheet

Project Name:		Project Number:	
UCPS Project Manager:			
Name (Please Print):	Company Name	Email Address and Phone Number	Phone Number
Brian Vaughan	Leitner Construction	Estimating@leitnerconstructionco.com	803-517-6079
Sean Prndergest	Vannoy	Sean.prndergest@jrvannoy.com	704-719-6443
Jeff Trexler	Geo Surfaces	j.trexler@geosurfaces.com	828-964-7899
David Locke	TSL	dlocke@TSportslight.com	704-604-7850
Brandon Stegall	TSL	bstegall@TSportslight.com	704-771-4398
Debbie Eaker	Path Construction	deaker@PathCC.com	847-997-3028
Kaitie Wood	Grahl Construction	kwood@grahlconstruction.com	404-433-4021
GREGG NEWELL	MUSCO LIGHTING	GREGG.NEWELL1@EMAIL.COM	704-604-8626
Ben Wagner	The Morz Group	bwagner@themorzgroup.com	843-609-6819
Jeson Taylor	J Taylor	jtaylorincnc@gmail.com	704-291-0502
Seth Rushing	Rushing Contracting Group	seth.rcg@gmail.com	704-219-8904
Perry Costales	True Rock	pcostales@truerockinc.com	609-204-1545
Frank Hostetter	Hostetter & Son	frank@hostetterandson.com	252-955-9577
Hoss Hinson	Hoss Contracting	hoss@hosscontracting.com	704 361 2299
Andrew Helms	Hinson Electric Inc	ahelms@hinsonelectricinc.com	704.242.8532
Drew Shoaf	AstoTurf / MUKITA	Drew.Shoaf@astoturf.com	336 596 3233
Anthony Muley	AstoTurf	Anthony.Muley@astoturf.com	336 451 7047

Bid#6-97648067 CATA Stadium

Pre-Bid Questions

- 1) I would like to have 2 products removed from the RFP that are listed under approved surfaces due to not being equal or comparable (they are actually inferior products). The basis of design is a Sealed base mat, structural spray system. #1 and #2 approved products are LATEX system and are not an equivalent surface/system.

The list under Section 2.1 of Spec Section 32 1825 is a list of approved manufacturers, not approved systems. The Basis of Design is the Beynon BSS 200 surface as listed in the specs. If one or more of the approved manufacturers does not have a system equivalent to the Basis of Design, it will not be accepted.

- 2) E & D Specialty Stands Inc would like to be listed as an approved manufacturer for the bleacher and press box. We are doing projects with Barnhill Construction in Snow Hill and Smithfield, and would love to be a part of this one as well. Attached is our digital catalog. We are one of the 6 national manufacturers, having been in business since 1978, if you are unfamiliar with us. Please let me know if you have any questions.

Revised Spec Section 13 3416.55 to add E&D Specialty Stands to the list of approved manufacturers.

- 3) I notice the specified shock pad for the artificial turf is Brock SP17XL. I have attached the cut sheet for our Tencate MaxFlo+ Shock Pad which is equal/greater to the BrockSP17XL and would like for this product to be considered/approved as an alternate. Thank you for your time and consideration.

The Owner prefers to stick with the Brock Shock Pad for this project for consistency across their other athletic facilities.

- 4) On page 135, section 1.04 submittals, A. mentions items to be submitted with the bid but B. seems like post-contract submittals. Is UCPS wanting submittals included with the bid or will they be required post bid once a vendor has been selected? Thanks!

Product submittals for the Synthetic Turf System can be submitted post-bid once a vendor has been selected.

- 5) I'm looking at the 199 page document for this bid. There is a drawing C-200 that shows locations for a scoreboard and field timers. There is no spec for these items. Are the scoreboard and field timers part of this bid? Or will the owner be purchasing them separately?

The scoreboard and field timers are part of this bid. Spec Section 32 1900 Exterior Athletic Equipment has been included in Addendum 1.

- 6) Do you have a list of GCs bidding this project? If we are to bid a scoreboard and field timers we need to know who to send our quotes to. Please advise.

A sign in sheet for the Pre-Bid has been included with this addendum.

- 7) There is a pre-bid meeting on June 23rd. Is this meeting for the GCs? Is it also mandatory for all subs? The prebid is mandatory for any contractors interested in submitting as a Prime. It is not mandatory for subs, but subs are welcome to attend.

5. I am reaching out to request additional Information on the bleachers. I have a few questions:
Do you know if you are wanting angle frame or I beam?
Either system is acceptable.
Do you any information on the Rise, tread, decking, finishes, etc?
All information is provided in Spec 13 3416.53, Section 2.02
6. We are submitting the following RFI's for review on the CATA Field Improvement Project for UCPS. I have also attached a Prebid submittal for your viewing.
To maintain consistency with existing athletic lighting installations currently utilized on the campus, please confirm the following will be accepted and/or required for all bidders:
Direct-embed galvanized steel poles with maintenance platforms.
Sports lighting fixtures utilizing integral drivers with remote fused service panels mounted approximately 10' above grade.
A 10-year manufacturer's material warranty in lieu of the specified 25-year system warranty.
These revisions will provide consistency with existing UCPS athletic facilities while maintaining the performance and functionality requirements of the project.
Direct embed steel poles are allowable along with a 10 year warranty. See revised Spec 26 5668.
- 8) Is there any type of cross section cut drawing of the bleachers/press box that the architect can provide?
Cross section of the press box is on the Architectural Sheet, however all items per manufacturer standard.
- 9) Will the catch basins for the perimeter channel drain need to be tied into the collector line?
The catch basins for the perimeter channel drain will be tied into the adjacent existing storm system similar to the subsurface perimeter drain. Connection locations can be flexible based on the optimal configuration of the channel drain.
Cross section A-A on sheet C-404 shows 2.25" turf, but the turf specs call for 2". Please advise.
Sheet C-404 has been revised to show 2" turf to match the spec.
Will an athletic equipment spec be provided?
Spec Section 32 1900 has been provided in Addendum 1.
Cross section A-A on sheet C-404 shows 4" of base stone and 1.5" of top stone, but page 15 of spec section 32-1823.19 section 3.11 sub section G and H call for 6" of base stone and 2" of top stone. Please advise.
Spec Section 32 1823.19 has been revised to indicate 4" of base stone. Plans show 1.5 inches of NCDOT #8 stone plus 0.5 inches of washed screenings to equal 2 inches of top stone.
Spec section 31-200 section 2.2 subsection B mentions a woven Geotextile (Mirafi 500x), but it cannot be located on the plans. Please confirm where the woven geo fabric is desired.

The Mirafi Geotextile listed in 31 2000 is only for use if unsuitable soils are encountered and the testing agency recommends use of Geotextile in lieu of undercut. It is not included in the base bid.

The subgrade on cross section B-B on sheet C-404 appears to have a cross slope similar to Cross section A-A. Please confirm there is no slope here.

There is no slope on the field in the long direction.

Plans show a new scoreboard and play clocks are to be provided. Could you please provide specifications for these items?

Spec Section 32 1900 has been provided in Addendum 1.

There are two details on sheet C-400 for the LJ/TJ runways and pit with different measurements. Can you please advise which is correct?

Revised detail on Sheet C-400 to correct the long jump and triple jump dimensions indicated in plan view.

10. Per NCHSAA lighting standards, track lighting is recommended to provide a maintained average illumination level of 20 footcandles with a maximum-to-minimum uniformity ratio of 4.0:1 for the track oval. The project specifications currently indicate 30 footcandles at a 2.5:1 ratio. Will the specifications be revised to align with NCHSAA standards?

The lighting is designed to meet football/soccer requirements and not necessarily for track and field events.

For the alternate bid item, no lighting levels or performance requirements are currently listed. Can you please clarify the intended requirements and scope of the alternate in relation to the base bid?

The Alternate is for an owner preferred manufacturer only. All other items remain as specified.

Will manufacturers be notified if their pre-bid submittal package has been reviewed and accepted for approved manufacturer status?

Any changes to approved manufacturers as a result of pre-bid requests will be added to the Bid Documents via this Addendum.

11. A ramp is not needed for the press box, Ramp Access is only required if the press box is over 500 ft.² - the ramp is big money for press box access.

The ramp is an Owner requirement.

Standard press box size is 8' x 30'.

Desired press box size is indicated on the Architectural Plans.

The press box can be accessed from the grandstand.

The ramp is an Owner requirement.

Walkway height is shown at 1', please confirm if this is correct? A Standard walkway height is either 30 inches or 42 inches for good site lines.

1 foot is the minimum height for the walkway.

Having the Bleachers behind the track and having the players on the sideline, the first five rows will be vacant. The bleacher section is very far from the field. It may need to be elevated, has this been considered?

Yes, it was considered and the design meets Owner requirements.

Is there any type of cross section cut drawing of the bleachers/press box that the architect can provide?

The Pressbox is shown in the Architectural drawings

Could you also provide a projected timeline for this project, specifically for the bleacher and press box?

Contractors should include a construction timeline with their bid. It is noted that the bleacher and press box could be long lead items and the Owner will work with the successful bidder to develop a procurement and construction schedule.

DIVISION 01

- 01 02 00 GENERAL SITEWORK REQUIREMENTS
- 01 21 00 SITEWORK ALLOWANCES
- 01 22 00 UNIT PRICES
- 01 23 00 ALTERNATES

DIVISION 02

- 02 41 13 SELECTIVE SITE DEMOLITION

DIVISION 13

- 13 34 16.53 BLEACHERS AND PRESS BOX

DIVISION 26

- 26 05 19 LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
- 26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
- 26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
- 26 05 33 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
- 26 05 44 SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING
- 26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS
- 26 27 26 WIRING DEVICES
- 26 56 68 EXTERIOR ATHLETIC LIGHTING

DIVISION 27

- 27 72 81 PRESSBOX SOUND SYSTEM

DIVISION 31

- 31 10 00 SITE CLEARING
- 31 20 00 EARTHWORK
- 31 25 00 EROSION CONTROL

DIVISION 32

- 32 12 16 ASPHALT PAVEMENT
- 32 13 13 SITE CONCRETE
- 32 18 23.19 SYNTHETIC TURF SYSTEM
- 32 18 25 RUNNING TRACK SURFACING
- 32 19 00 EXTERIOR ATHLETIC EQUIPMENT**
- 32 3113.19 CHAIN LINK FENCES AND GATES (PVC CLAD)

DIVISION 33

- 33 41 00 STORM DRAINAGE

SECTION 133416.53
BLEACHERS & PRESS BOX – ADDENDUM 01

PART 1 GENERAL

1.01 DEFINITIONS

- A. Bleacher: Non-elevated, portable, tiered stand of benches to provide seating at a sports ground.
- B. Press Box: A restricted facility located at a sporting venue to observe and announce events.

1.02 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
- C. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).
- D. ADA Standards - 2010 ADA Standards for Accessible Design.
- E. AISC (MAN) - Steel Construction Manual.
- F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- H. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- J. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
- K. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
- L. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- M. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- N. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- O. AWS D1.2/D1.2M - Structural Welding Code - Aluminum.
- P. NAAMM AMP 500-06 - Metal Finishes Manual.
- Q. NFPA 70 - National Electrical Code.
- R. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic).

1.03 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design bleachers, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

- B. Structural Performance Characteristics: Engineer, fabricate, and install bleachers capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Wind Loads: Determine loads based on the following minimum design wind pressures:
 - a. Uniform pressure as required by local authorities having jurisdiction and as indicated on Structural drawings.
 - 2. Snow Loads: As required by local authorities having jurisdiction.
 - 3. Live Loads: 100 psf gross horizontal area.
 - 4. Perpendicular Sway Load: 10lbs/lineal ft of seat plank.
 - 5. Lateral Sway Load: 24 lbs/lineal ft of seat plank.
 - 6. Live Load for Seat and Tread Planks: 120lbs/lineal ft to seats and footboards.
 - 7. Top Rails of Guardrails:
 - a. Uniform load of 50lbf/ ft. applied in any direction.
 - b. Concentrated load of 200lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 8. Infill of Guardrails:
 - a. Concentrated load of 50lbf applied horizontally on an area of 1 sq. ft.
 - b. Infill load and other loads need not be assumed to act concurrently.
- C. Thermal Movements: Provide bleachers that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Detailing, fabrication, and installation of bleachers shall be in accordance with AISC (MAN) for steel and Aluminum Association's Specifications for Aluminum Structures.
- E. Shop Connections: Welded and capable of carrying stress put upon them.
- F. Welding: Comply with AWS Standards.

1.04 SUBMITTALS

- A. Product Data: For each bleacher component. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 1. Submit manufacturer's product specifications and installation instructions for each type of bleacher and accessory as required.
- B. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication and assembly of bleachers, as well as procedures and diagrams. Submit shop drawings indicating layout of bleacher seating systems coordinated with field measurements and including seat heights, row spacing and rise, aisle widths and locations, overall dimensions, connections and relationship to adjoining work, accessories, types of materials and finishes.
 - 1. Shop Drawings require approval of local building inspector and North Carolina Department of Public Instruction (NCDPI). Contractor shall provide shop drawings to Architect for submittal to both entities; approval from both shall be required prior to Architect's approval of Bleacher submittal.

2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 3. Surveyor, at the expense of contractor, shall verify existing conditions prior to submittal drawings. Survey shall be submitted as part of submittal process.
 4. Statement of Compliance: On every sheet of submittal drawings, the following statement shall be executed and dated by the authorized agent of the contractor responsible for such work – “This is to certify that all specification requirements have been met and all dimensions, conditions and quantities are verified as shown and / or corrected on these submittal drawings”.
- C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Welding certificates.
- E. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements.
- F. Qualification Data: For Installer.
- G. Field Quality-Control Report: Indicate compliance of installed bleachers and components with requirements.
- H. Maintenance Data: For each product to include in maintenance manuals.
- I. Warranties: Special warranties specified in this Section.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engage a firm experienced in manufacturing bleachers similar in size and scope to those indicated for this Project and with an established record of successful-in-service performance.
1. Manufacturer's responsibilities include providing professional engineering services for designing bleachers to comply with performance requirements.
- B. Installer Qualifications: Engage an experienced Installer to perform the work of this Section who has specialized in installing types of bleacher similar to those required for this Project and who is acceptable to, or certified by, manufacturer of bleachers.
- C. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the state where the Project is located, and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of bleachers that are similar to that indicated for this Project in material, design, and extent.
- D. Source Limitations: Obtain bleachers through one source from a single manufacturer.
- E. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M and AWS D1.2/D1.2M.
- F. Regulatory Requirements: In addition to local governing regulations, comply with applicable provisions in the applicable statewide building code.
1. Comply with statewide regulations pertaining to industrialized, manufactured, or modular buildings, including completion of third-party inspections at the manufacturing facility. Arrange and provide for all necessary inspections and certifications as required to obtain a state registration seal or certificate, as applicable, indicating that structure is approved for Owner occupancy.

- G. Accessibility Requirements: In addition to local governing regulations, comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA Standards.
- H. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- I. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201.

1.06 PROJECT CONDITIONS

- A. Field Measurements: Control points and elevations shall be established by the project surveyor. Dimensions and measurements shall be shown on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.07 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of bleacher that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
 - 1. Structural failures including, but not limited to, excessive deflection.
 - 2. Failure of system to meet performance requirements.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- B. Warranty Period: One year from date of Substantial Completion.
- C. Warranty Period for Metal Finishes: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with all requirements of the Contract Documents, provide products by one of the following:
 - 1. Southern Bleacher Company.
 - 2. Dant-Clayton Corporation.
 - 3. Outdoor Aluminum, Inc.
 - 4. Sturdisteel.
 - 5. **E&D Specialty Stands Inc.**
 - 6. **Southeastern Seating, Inc**
 - 7. **Bleachers International. - Addendum 01**
- B. Submission of bid is indication that ALL parts / products of the specification shall be provided.
- C. Other manufacturers seeking to be approved must submit product literature, list of similar jobs, and product samples ten days prior to bid date that matches the specified product for review and acceptance by the Architect. Architect shall provide written acceptance of additional approved manufacturers through addendum. No substitutions shall be considered after the bid.

2.02 BLEACHERS

- A. Materials:
 - 1. Steel: ASTM A36/A36M.
 - 2. Aluminum: ASTM B209/B209M; 6063-T6 extruded alloy.

CATA FIELD IMPROVEMENTS
Union County Schools, NC
Architect's Project No.: 660235

3. Concrete Foundation/Pad: Minimum compressive strength of 3000 psi at 28 days. Coordinate with Civil drawings.
4. Accessories:
 - a. Steel Connections: ASTM A307, galvanized.
 - b. Aluminum Components: ASTM A307, cadmium plated.
 - c. Hold-Down Clip Assembly and End Caps: Aluminum Alloy 6063-T6.
- B. Framing Members: Fabricate understructure framing of aluminum or galvanized steel per manufacturer's standard. Painted non-galvanized steel is not acceptable.
 1. Stringers: 6 feet o.c. maximum
 2. Columns: Spaced at 6 feet o.c. longitudinal.
 3. Cross Braces: Steel angles or rod bracing, as standard with manufacturer.
- C. Guardrail System: Provide guardrails at all sides of bleacher.
 1. Material: Anodized aluminum pipe, with end plugs at ends of straight runs and elbows at corners. Secure to angle rail risers with galvanized fasteners.
 2. Top Railing: Minimum 42 inches above walkways, entrances, and above center of any adjacent seat.
 3. Chain Link Infill on Side and Back: 6 gage black vinyl coated, galvanized fabric fastened in place with galvanized fittings and aluminum ties.
 4. Handrail: Provide manufacturer's standard handrail assembly, minimum 34 inches high, centered in middle of each aisle stairway.
- D. Aluminum Seat Boards: Nominal 2 inches by 10 inches, extruded aluminum with minimum wall thickness of 0.094 inches. Matching aluminum end caps shall be furnished at aisles and ends of each seat board. All steel surfaces in contact with aluminum seats shall be treated to prevent electrolytic action. Seat boards shall be secured to their steel supports by means of extruded aluminum clips and 5/16-inch-diameter bolts. All splices shall occur at steel supports. Splices in other locations will not be permitted.
- E. Aluminum Footboards: Size per component requirements, non-slip aluminum planks made of 6063-T6 aluminum alloys with minimum wall thickness of 0.094 inches. Footboards shall be secured to their steel supports by means of extruded aluminum clips and 5/16-inch-diameter bolts. All splices shall occur at steel supports. Splices in other locations will not be permitted.
 1. Provide tread system comprised of aluminum extrusions which fit together length-wise in a male-female shape running length of planks. This tongue and groove mechanism shall minimize deflection and not separate due to loads being applied to individual planks. The locking mechanism by design shall allow for expansion and contraction of individual planks without effecting performance of the system.
 2. The system shall cause the deck planks to react together at all treads and cross walks to live load and form the appearance of a single tread system. By design, this system forms a solid, overlapping tread and riser installation.
 3. The nose extrusion shall allow for a 1 inch extruded aluminum contrasting nose piece to be flush mounted on the leading edge and shall capture the vertical riser plank in an extruded pocket. The heel extrusion shall have a .70 inch vertical lip at the rear of the plank to allow for placement of vertical riser plank.
 4. These extrusions shall be such that the attachment of the seat brackets, step brackets, mid-aisle rails and all other components is accomplished without deck penetrations. Through bolting or drilling of the aluminum tread / riser system is not permitted.

5. The system shall allow for seat and aisle reconfiguration at any time without evidence of its previous configuration.
 6. Entry stairs to be 2 x 12 mill finish aluminum with inset extrusion to accept contrasting nosing member.
 7. Ramp planks to be interlocking to resist deflection of live loads.
 8. Open ends of planks to be covered with anodized aluminum end caps, securely fastened to the plank.
 9. Joint sleeves: Dual joint sleeves to be inserted at each butt joint of each load bearing aluminum plank, and to penetrate 6 inches into each plank at the joint. Joint sleeves are not required at secondary gutter locations.
- F. Aluminum Risers: Aluminum planks made of 6063-T6 aluminum alloys with minimum wall thickness of 0.094 inches. Provide continuous aluminum riser closures between all footboards. Through bolting or drilling of the riser board is unacceptable.
- G. Stairs: 2-by-12 inch aluminum treads with maximum 7-inch rise.
- H. Hardware: Provide tamperproof and galvanized connections for seat boards, guardrails, and guardrail pipe. Footboard connections shall be made with galvanized fasteners.
- I. Concrete Pad: Provide 3000 psi compressive strength concrete.
- J. Finishes:
1. Steel: Hot-dipped galvanized after fabrication in accordance with ASTM A123/A123M.
 2. Aluminum:
 - a. Seat boards: Clear anodized aluminum.
 - b. Aluminum Footboards: Mill finish.
 - c. Riser Boards: Dur-Kyn Kynar paint system.
- K. HVAC:
1. Provide Friedrich Zoneaire premier PTAC model number PDE12k3SGR3 or equal.
 2. 12,300 btu/hr of cooling with 3,500 watts of electric heat, 240v, R32 refrigerant, 6-20p power cord to plug into 20a/ 2-pole receptacle.
 3. 58 decibels maximum sound power.
 4. Standards 2 years parts, 5 years limited warranty.
 5. ETL & CETL listed, AHRI certified.
 6. Cooling efficiency: EER 11.6.
 7. Insulated wall sleeve: model number PDXWSA
 8. Grille: PXGA
 9. Provide Honeywell home RTH2510b programmable thermostat of equal for remote control and wire to PTAC.

2.03 PRESS BOXES

- A. Product Description: Type II Construction.
1. Press Box Support Structure: Press box shall be anchored with structural mechanism to support all engineered loads as determined by manufacturer's engineer.
 2. Press Box Dimensions: Nominal dimensions as indicated on Drawings.
 3. Press Box to be constructed in accordance with approved shop drawings.
- B. Materials/Finishes

CATA FIELD IMPROVEMENTS
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1. Press Box Support Structure:
 - a. Structural shapes meet one of the following ASTM specifications: ASTM A36/A36M, ASTM A36/A572 grade 50, ASTM A572/A572M grade 50, ASTM A529/A529M grade 50, or ASTM A500/A500M grade B.
 - b. Shop connections are seal welds.
 - c. After fabrication, all steel is hot-dipped galvanized to ASTM A123/A123M specifications.
2. Press Box: All materials shall be new and shall comply with ASTM specifications.
 - a. Floor
 - 1) Main support to be a galvanized steel floor frame sized to support structure and metal belly pan for support of insulation.
 - 2) Floor to be interlocking Aluminum Decking System, extruded aluminum alloy 6063-T6, mill finish. Attach Decking System to steel floor frame with mechanical fasteners at plank ends and intermediate supports. (Standard extrusions that do not connect are not acceptable.)
 - 3) Insulation: Kraft faced fiberglass building insulation R-11, 3 1/2 inches thick. Batt or roll per manufacturer standard.
 - b. Wall Structure
 - 1) 4 inch x 4 inch x 11 gauge square tubing with maximum span of 14 feet on front wall and maximum span of 6 feet on back wall and 4 inch x 2 1/2 inch x 14 gauge steel "cees" with maximum spacing of 5 feet for all walls with siding. Spans greater than these require engineered calculations for design.
 - 2) Insulation: Kraft-faced fiberglass building insulation R-11, 3 1/2 inches thick. Batt or roll per manufacturer standard.
 - 3) Front Wall: Sloped as shown on drawings. Wall shall be engineered to provide for minimum supports / maximum glass coverage.
 - 4) Side Wall: Sloped as shown on drawings. Wall shall be engineered to provide side windows for maximum glass coverage and exit door.
 - 5) Interior Finish
 - (a) 1/2-inch vinyl coated gypsum panels.
 - (b) Cove Base: Vinyl, 4 inches x .080-thickness.
 - 6) Exterior Finish
 - (a) 6 gauge pre-finished R-Panel paneling. Color as selected by Architect from manufacturer's standard range.
 - (b) Wall panels are attached with #12 TEK screws - 6" O.C. at the top and bottom of the panels.
 - (c) Lap screws are placed at panel ends, at the intermediate supports, and at the mid point between supports (TEK #14).
 - (d) All fasteners to be painted same color as exterior paneling.
 - c. Roof Structure
 - 1) 4 inch x 4 inch x 11 gauge square tubing with maximum spacing of 6 feet on center and 4 inches x 2 1/2 inches x 14 gauge steel "cees" with maximum spacing of 2 feet on center.
 - 2) Roof: 1/8 inch four-way steel plate roof, continuous welded seams coated with acrylic metal primer and minimum 36 mils of acrylic roof coating. Plate is welded on both sides of rafters with 1-1/2 inch long 1/8-inch fillet welds on 12-inch centers.

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- 3) Insulation: Kraft faced fiberglass building insulation, R-19 (minimum) 6 inches thick. Batt or roll per manufacturer standard.
 - 4) Cornice: 26-gauge steel pre-finished to match metal siding.
 - 5) Ceiling: 24 inch x 24 inch x 5/8 inch fissured-type acoustical ceiling tile with grid main tee, cross tee, wall angle, wind clips and other components as required.
 - 6) Provide aluminum pipe and chain-link fence fabric guardrail assembly as specified at Observation Deck.
- d. Exterior Doors:
- 1) Full flush steel construction with honeycomb core. 18 gauge skin sheets. Dimensions: 3 feet 0 inches x 6 feet 8 inches. Color: White.
 - 2) Steel doorframe (16 gauge) complete with 1/2-inch threshold and weather-stripping.
 - 3) Exterior Hardware: Handles shall be lever- type that allows operation without tight grasping or twisting of the wrist. Keyed alike locks.
 - 4) Interior Hardware: Exit Device. Handle shall be panic bar that allows for opening without any grasping, twisting or turning.
- e. Interior Walls:
- 1) Framing to be steel galvanized studs (25 gauge) 1 1/4 inch x 3 5/8 inch at maximum 2 feet on center.
 - 2) Finishes to be consistent with all other interior finishes.
 - 3) Fixed glass windows (2'0" by 4'8") shall be located at front of interior walls above counter to allow for better viewing.
- f. Exterior Windows:
- 1) Frame: Extruded aluminum single hung, vertical sliding unit, thermally-broken.
 - 2) Sash: Tilt toward inside for easy cleaning.
 - 3) Glazing: Clear tempered panes.
 - 4) Dimensions of each unit: Dependent on compartment size. At interior wall locations or structural support locations the dimension between windows shall be no greater than 6 inches.
 - 5) Finish: Electro-statically applied acrylic enamel.
- g. Work Bench:
- 1) 18-inch-wide workbench constructed of 4 inch x 2 1/2 inch x 14 gauge steel, and 3/4" wood. Countertop heights shall be constructed to allow wheelchair usage at all locations.
 - 2) Plastic laminate top: Thickness: 0.50 (12 mm nominal). Color selected from manufacturer's standard range.
 - 3) Glue: Manufacturer's standard; contact adhesive.
- h. Painting:
- 1) Surfaces: Exterior Doors, Door Frames
 - (a) Primer: Applied by Door Manufacturer.
 - (b) Finish: 2 coats acrylic latex semi-gloss enamel applied by press box manufacturer.
 - 2) Surfaces: Exterior Siding
 - (a) Primer: Applied by Siding Manufacturer.
 - (b) Finish: Applied by Siding Manufacturer.

- (c) Touchup: If applicable.
- i. Surfaces: Wall and Roof Structure
 - 1) Primer: DTM Industrial acrylic metal primer applied after welding, or equal.
- j. Caulking: Exterior-grade polyurethane sealant, all temperature, UV resistant. Silicone products are not acceptable.
- k. Electrical
 - 1) Submittal drawing shall indicate devices and circuitry.
 - 2) Fixtures: 2-lamp, 28-watt T5 fluorescent, recessed mount design. Locate fixtures above countertop and maximize to full length of compartment space.
 - 3) Wiring to be run in rigid metal conduit or equal. N.E.C. breaker box to be 100-amp flush mounted on rear wall with 1-1/4-inch rigid conduit to be stubbed out bottom of press box ready for service line to be connected. (Service line to Press Box is responsibility of Owner).
 - 4) Electrical outlets installed per NEC shall be standard duty. All outlets shall be flush mounted on wall.
 - 5) Sound, Telephone, Clock, Field Communication: Empty double outlet boxes per N.E.C. with 3/4-inch conduit stubbed out bottom of Press Box for use of Owner. Outlet boxes to be flush mounted into wall. Any wiring completed on-site shall be responsibility of such contractor for inspections. Quantity. Two shall be provided. Owner shall indicate additional boxes needed.
 - 6) Observation Deck: Weather-tight outlet box for cameras. Quantity: Two. Owner shall indicate additional outlets needed.
 - 7) Baseboard heaters: 1,500-watt heaters as shown on Drawings, including circuitry to panelboards.

2.04 FINISHES, GENERAL

- A. Comply with NAAMM AMP 500-06 for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.

2.05 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: non-specular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
- C. Aluminum Painted Finish:
 - 1. All painted aluminum shall have factory applied, baked-on Kynar or Hylar/acrylic resin based paint coating, Dur-Kyn, as manufactured by the Val spar Corporation. Dur-Kyn meets or exceeds the physical and performance properties of AAMA 2603. Powder coated finishes are not considered equal to Kynar type finishes.
 - 2. Color: As selected by Architect from manufacturer's full range.

2.06 GALVANIZED STEEL FINISHES

- A. Surface Preparation: Clean surfaces with non-petroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A780/A780M.
 - 1. Galvanizing Repair Paint: High-zinc-dust-content paint for re-galvanizing welds in steel, complying with SSPC-Paint 20.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for, installation tolerances, and other conditions affecting performance of work.
- B. Verify with Owner's testing company that foundation bearing conditions are in accordance with assumptions made in design calculations and Shop Drawings.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 ERECTION

- A. Install pre-engineered bleachers in accordance with manufacturer's instructions and final Shop Drawings. Provide accessories indicated or required and anchors, inserts and other items required for installation of units and attachment of adjoining construction.
- B. Set press box plumb and aligned. Level base plates true to plane.
- C. Connect electrical power service to power distribution system according to requirements specified in Division 26.

3.03 FIELD QUALITY CONTROL

- A. Arrange for bleacher manufacturer's technical personnel to inspect bleachers and components during installation and at final completion and to certify compliance with requirements.
 - 1. Notify Architect 48 hours in advance of date and time of final inspection.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Tests and Inspections:
 - 1. Installation: Installation shall be inspected for compliance with approved shop drawings and for safety prior to use.

3.04 ADJUSTING AND CLEANING

- A. Adjust doors, operable windows, and hardware to operate smoothly, easily, properly, and without binding. Confirm that locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.
- C. Clean installed bleachers on exposed and semi-exposed surfaces. Touch-up shop applied finishes to restore damaged or soiled areas.

END OF SECTION 133416.53

SECTION 265668 – EXTERIOR ATHLETIC LIGHTING – **Addendum 01**

PART 1 – GENERAL

1.1 SUMMARY

- A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.
- B. The purpose of these specifications is to define the lighting system performance and design standards using an LED Lighting source. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.
- C. The primary goals of this sports lighting project are:
 - a. Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore, light levels are guaranteed to not drop below specified target values for a period of 25 years.
 - b. Environmental Light Control: It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors.
 - c. Cost of Ownership: In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated for the duration of the warranty.
 - d. ~~Control and Monitoring: To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system. Fields should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.~~ Addendum 1
 - 5. ~~Entertainment Features: Incorporation of theatrical light shows enhance the presentation and enjoyment of players and spectators. Control system shall incorporate pre-programmed light shows such as "chase", "wave", and "score." Control system shall incorporate the ability to initiate these shows locally. System shall be able to time light shows to customer supplied music.~~ Addendum 1
 - 6. ~~Accent Lighting: To allow for custom lighting effects, including team colors, lighting for special occasions, and theatrical effects, all poles should be equipped with RGB accent luminaires to illuminate the structures in various custom colors. Colors should be selectable via an onsite device.~~ Addendum 1

1.2 LIGHTING PERFORMANCE

- A. Illumination Levels and Design Factors: Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Appropriate light loss factors shall be applied and submitted for the basis of design. Average illumination level shall be measured in accordance with the IESNA LM-5-04 (IESNA Guide for Photometric Measurements of Area and Sports Lighting Installations). Illumination levels shall not to drop below desired target values in accordance to IES RP-6-15, Page 2, Maintained Average Illuminance and shall be guaranteed for the full warranty period.

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Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Spacing
Field	50 footcandles	2.0:1	30' x 30'
Track	30 footcandles	2.5:1	30' x 30'

- B. Color: The lighting system shall have a minimum color temperature of 5700K and a CRI of 65+.

1.3 ENVIRONMENTAL LIGHT CONTROL

- A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical or overuse of narrow beam patterns are accepted.
- ~~B. Glare Control: Maximum candela values at a distance of 150 feet and a height of 3 feet are defined for typical sports fields below. Addendum 1~~

Typical Field Type	Maximum Candela at 150 feet
Field	~~<40,000 candela~~
Track	~~<30,000 candela~~

- C. Spill Scans: Spill scans must be submitted indicating the amount of horizontal footcandles along the specified lines. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights. Illumination level shall be measured in accordance with the IESNA LM-5-04 after 1 hour warm up.

- ~~D. Candela scans must be submitted showing candela at 150' from each field Addendum 1~~

- E. The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years' experience or by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.

1.4 Cost of Ownership

- A. Manufacturer shall submit a 25-year Cost of Ownership summary that includes energy consumption, anticipated maintenance costs, and all control costs. All costs associated with faulty luminaire replacement - equipment rentals, removal and installation labor, and shipping - are to be included in the maintenance costs.

PART 2 – PRODUCT

2.2 SPORTS LIGHTING SYSTEM CONSTRUCTION

- A. Preferred Manufacturer: Torrence lighting <https://tsportslight.com/>
Refer to Owner Preferred Alternate - **Addendum 01**
Other Manufacturer but not limited to: Premier Sports Lighting. _ Addendum 01
- B. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.
- C. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.
- D. System Description: Lighting system shall consist of the following:
1. Galvanized steel poles and cross-arm assembly. Alternate: Concrete pole with a minimum of 8,000 psi and installed with concrete backfill will be an acceptable alternative provided building code, wind speed and foundation designs per specifications are adhered to.
 2. **Steel poles should include integrated or engineered maintenance platforms to allow for safe and efficient service and maintenance. - Addendum 01**
 3. Non-approved pole technology:
 - a. Square static cast concrete poles will not be accepted.
 - b. ~~Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns. Addendum 01~~
 4. Lighting systems shall use concrete foundations. See Section 2.4 for details.

Direct Embed will be acceptable – Addendum 01

 - a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection; actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.
 - b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or reinforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.
 5. Manufacturer will supply all drivers and supporting electrical equipment
 - a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include

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drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure. Integral drivers are not allowed.

- b. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.
- 6. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
- 7. All luminaires, visors, and cross-arm assemblies shall withstand 150 mi/h winds and maintain luminaire aiming alignment.
- 8. Control cabinet to provide remote on-off control, monitoring, and entertainment features of the lighting system. See Section 2.3 for further details.
- 9. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
 - a. Integrated grounding via concrete encased electrode grounding system.
 - b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780. The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.

D. Safety: All system components shall be UL listed for the appropriate application.

2.2 ELECTRICAL

- A. Electric Power Requirements for the Sports Lighting Equipment:
 - 1. Electric power: 480 Volt, 3 Phase
 - 2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

2.3 CONTROL

- A. **Basis of Design: Skylogix ARC-10 Wireless Control Station to match existing controls present at the site. - Addendum 01**
- B. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.
- C. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.
- ~~D. **Dimming: System shall provide for 3 stage 4 stage dimming (high medium low blackout). Dimming will be set via scheduling options (Website, app, phone, fax, email) or via an on-site user interface tablet or device. Addendum 1**~~
- E. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

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The owner may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields to only having permission to execute "early off" commands by phone. Scheduling tool shall be capable of setting curfew limits.

Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

- ~~F. **Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed). Addendum 1**~~
- ~~G. **Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS, Android and Blackberry devices.**~~
- ~~**Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the owner.**~~
- ~~1. **Cumulative hours: shall be tracked to show the total hours used by the facility**~~
- ~~2. **Report hours saved by using early off and push buttons by users. Addendum 1**~~
- H. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring system for a period of 25 years.
- I. Communication with luminaire drivers: Control system shall interface with drivers in electrical components enclosures by means of powerline communication.
- ~~J. **Entertainment Features: Control System shall store six (6) preprogrammed light shows per field with option for customized scenes. Shows shall be initiated by a manufacturer provided touchscreen user interface on the control system network. Addendum 1**~~

2.4 STRUCTURAL PARAMETERS

- A. Wind Loads: Wind loads shall be based on the 2015 International Building Code. Wind loads to be calculated using ASCE 7-10, an ultimate design wind speed of IBC 2015, 115 MPH and exposure category C.
- B. Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2013 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (LTS-6).
- C. Foundation Design: The foundation design shall be based on soil parameters as outlined in the geotechnical report. If no geotechnical report is available, the foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2015 IBC Table 1806.2.
- D. Foundation Drawings: Project specific foundation drawings stamped by a registered engineer in North Carolina are required. The foundation drawings must list the moment, shear (horizontal) force, and axial (vertical) force at ground level for each pole. These drawings must be submitted at time of bid to allow for accurate pricing.

PART 3 – EXECUTION

3.1 SOIL QUALITY CONTROL

- A. It shall be the Contractor's responsibility to notify the Owner if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. Contractor may issue a change order request / estimate for the Owner's approval / payment for additional costs associated with:
 - 1. Providing engineered foundation embedment design by a registered engineer in the State of North Carolina for soils other than specified soil conditions.
 - 2. Additional materials required to achieve alternate foundation.
 - 3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

3.2 DELIVERY TIMING

- A. Delivery Timing Equipment On-Site: The equipment must be on-site 6 weeks from receipt of approved submittals and receipt of complete order information.

3.3 FIELD QUALITY CONTROL

- A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA LM-5-04.
- B. Field Light Level Accountability
 - 1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 years. These levels will be specifically stated as "guaranteed" on the illumination summary provided by the manufacturer.
 - 2. The contractor/manufacturer shall be responsible for conducting initial light level testing and an additional inspection of the system, in the presence of the owner, one year from the date of commissioning of the lighting.
 - 3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.
- C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

3.4 WARRANTY AND GUARANTEE

- A. **10 Year Addendum 01 ~~25-Year~~ Warranty:** Each manufacturer shall supply a signed warranty covering the entire system for **10 Year Addendum 01 ~~25-Year~~** from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.
- B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for **10 Year Addendum 01 ~~25-Year~~** from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be

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repaired when the usage of any field is materially impacted. Manufacturer is responsible for removal and replacement of failed luminaires, including all parts, labor, shipping, and equipment rental associated with maintenance. Owner agrees to check fuses in the event of a luminaire outage.

PART 4 – DESIGN APPROVAL

4.0 SUBMITTAL REQUIREMENTS

- A. Approved Product: Provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required.
- B. All listed manufacturers not pre-approved shall submit the information at the end of this section at least 10 days prior to bid.

4.1 REQUIRED SUBMITTAL INFORMATION FOR ALL MANUFACTURERS (NOT PRE-APPROVED) 10 DAYS PRIOR TO BID

- A. All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements. Complete the Yes/No column to indicate compliance (Y) or noncompliance (N) for each item. Submit checklist below with submittal.

Tab	Item	Description
A	Letter/ Checklist	Listing of all information being submitted must be included on the table of contents. List the name of the manufacturer's local representative and his/her phone number. Signed submittal checklist to be included.
B	Equipment Layout	Drawing(s) showing field layouts with pole locations
C	On Field Lighting Design	Lighting design drawing(s) showing: a. Field Name, date, file number, prepared by b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y), Illuminance levels at grid spacing specified c. Pole height, number of fixtures per pole, horizontal and vertical aiming angles, as well as luminaire information including wattage, lumens and optics d. Height of light test meter above field surface. e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaires, total kilowatts, average tilt factor; light loss factor.
D	Off Field Lighting Design	Lighting design drawing showing initial spill light levels along the boundary line (defined on bid drawings) in footcandles. Lighting design showing glare along the boundary line in candela. Light levels shall be taken at 30-foot intervals along the boundary line 150' from each field. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights.
E	Photometric Report	Provide first page of photometric report for all luminaire types being proposed showing candela tabulations as defined by IESNA Publication LM-35-02. Photometric data shall be certified by laboratory with current National Voluntary Laboratory Accreditation Program or an independent testing facility with over 5 years experience.
F	Performance Guarantee	Provide performance guarantee including a written commitment to undertake all corrections required to meet the performance requirements noted in these specifications at no expense to the owner. Light levels must be guaranteed to not fall below target levels for warranty period.

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G	Structural Calculations	Pole structural calculations and foundation design showing foundation shape, depth backfill requirements, rebar and anchor bolts (if required). Pole base reaction forces shall be shown on the foundation drawing along with soil bearing pressures. Design must be stamped by a structural engineer in the state of North Carolina, if required by owner.
H	Control & Monitoring System	Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system and entertainment packages. They will also provide ten (10) references of customers currently using proposed system and exact fixture in the state of North Carolina
I	Electrical Distribution Plans	Manufacturer bidding an alternate product must include a revised electrical distribution plan including changes to service entrance, panels and wire sizing, signed by a licensed Electrical Engineer in the state of North Carolina.
J	Warranty	Provide written warranty information including all terms and conditions. Provide ten (10) references of customers currently under specified warranty in the state of North Carolina.
K	Project References	Manufacturer to provide a list of 5 projects where the technology and specific fixture proposed for this project has been installed in the state of North Carolina. Reference list will include project name, project city, installation date, and if requested, contact name and contact phone number.
L	Product Information	Complete bill of material and current brochures/cut sheets for all product being provided.
M	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.
N	Non-Compliance	Manufacturer shall list all items that do not comply with the specifications. If in full compliance, tab may be omitted.
O	Cost of Ownership	Document cost of ownership as defined in the specification. Identify energy costs for operating the luminaires. Maintenance cost for the system must be included. All costs should be based on 25 Years
P	Environmental Light Control Design	Environmental glare impact scans must be submitted showing the maximum candela 150' from the field edge on a map of the surrounding area until 500 candela or less is achieved.

SECTION 277281 – PRESSBOX FIELD SOUND SYSTEMS —**Addendum 01**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The drawings and general provisions of the Contract Documents apply to this Section.

1.2 SUMMARY

- A. This Section includes a complete and operational sound system with equipment for amplifying, distributing, and reproducing sound signals.
- B. Each system shall incorporate two (2) full range, ultra high output speakers in weatherproof, speaker enclosures. Aim each speaker at its respective bleacher section for proper coverage.
- C. Equipment specifications, quantities and installation requirements refer to each sound system for each field (not total for all fields).
- D. House all equipment in a portable equipment cabinet. Equip the portable cabinet with a storage drawer to house microphones and intercom phones.
- E. Provide XLR outlets into the face of a rack mounted panel allowing microphone access from the front of the portable equipment cabinet.
- F. Warranty equipment for one year against defective materials and workmanship.

1.3 DEFINITIONS

- A. Channels: Separate parallel signal paths, from sources to loudspeakers or loudspeaker zones, with separate amplification and switching that permit selection between paths for speaker alternative program signals.
- B. Zone: A separate group of loudspeakers and associated supply wiring that may be arranged for selective switching between different channels.
- C. VU: Volume unit.

1.4 PERFORMANCE REQUIREMENTS

- A. System Functions: Include the following:
 - 1. Selectively connecting separate zones to different signal channels.
 - 2. Selectively amplifying sound among various microphone outlets and other inputs.
 - 3. Communicating simultaneously to all zones regardless of zone or channel switch settings.

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4. Reproducing high-quality sound that is free from noise and distortion at all loudspeakers at all times during equipment operation, including standby mode with inputs off; and output free from non-uniform coverage of amplified sound.

1.5 SUBMITTALS

- A. Product Data: For each type of equipment.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, required clearances, method of field assembly, components, and location of each field connection.
 1. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring. Identify terminals to facilitate installation, operation, and maintenance. Include a single-line diagram showing cabling interconnection of components.
 2. Provide coverage plots with shop drawing submittal the dispersion pattern necessary to flood each bleacher section.
 3. Custom pole mount drawing with load characteristics for approval prior to ordering equipment.
- C. Product Certificates: Signed by manufacturers of equipment certifying that products furnished comply with specified requirements.
- D. Installer Certificates: Signed by manufacturer certifying that installers comply with requirements.
- E. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements.
- F. Field Test Reports: Indicate and interpret test results for compliance with performance requirements. Include record of final speaker-line matching transformer-tap settings, and signal ground-resistance measurement certified by Installer.
- G. Maintenance Data: For equipment to include in maintenance manuals specified in Division 1.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is an authorized representative of equipment manufacturer for both installation and maintenance of equipment required for this Section. An installer has been regularly engaged in the furnishing and installation of commercial and industrial sound system for a period of at least two (2) years
- B. The Installer shall be bonded, hold a Class "A" Contractors License, and be a factory authorized sales and installation contractor for this product.
- C. All equipment and materials required for installation under these specifications shall be less than one (1) year from date of manufacture.

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- D. Each major component of equipment shall have the manufacturer's name, address and model number on a plate securely affixed in a conspicuous place. NEMA code ratings, UL Label, or other data that is die-stamped into the surface of the equipment shall be easily visible.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: All subject to compliance with requirements.

2.2 EQUIPMENT

- A. Coordinate features to form an integrated system. Match components and interconnections for optimum performance of specified functions.
- B. Equipment: Modular type, using solid-state components, fully rated for continuous duty, unless otherwise indicated. Select equipment for normal operation on input power usually supplied at 110 to 130 V, 60 Hz.
- C. Waterproof Equipment: Listed and labeled for duty outdoors or in damp locations.

2.3 MIXER/PREAMPLIFIERS

- A. Frequency Response: Within plus or minus 2 dB from 150 to 20,000 Hz for Mic/Line inputs. Within plus or minus 2 dB from 20 to 20,000 Hz for auxiliary inputs.
- B. Input Jacks: Two (2) balanced low-impedance microphone and three (3) unbalanced auxiliary inputs.
- C. Provide 12v phantom power for condenser microphone usage.
- D. Controls: Individual gain controls for each channel. Overall Bass and Treble controls, as well as an overall Master Gain control for overall signal adjustments.

~~E. Basis of design: Shure SCM262 or equivalent~~ **Addendum 01**

2.4 POWER AMPLIFIERS

- A. Comply with EIA SE-101-A.
- B. Output Power: 1950 watts into 4 ohms and 1320 watts into 8 ohms in bridged mono mode.
- C. Frequency Response: Within plus or minus 1 dB from 20 to 20,000 Hz at 1 watt.

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- D. Minimum Signal-to-Noise Ratio: A weighted signal to noise ratio of >100 dB at 20 to 20,000 Hz.
- E. Provide cooling through a fan-on-demand, proportional speed, from front to rear.

~~F. Basis of design: Crown CE2000. Addendum 01~~

2.5 DIGITAL PROCESSOR

- A. Shall be a single channel, digital processor combining a comprehensive, dynamics processor, two parametric equalizers, and delay processor into one unit.
- B. The processor shall operate as a gate, expander, auto gain control (AGC) leveler, compressor, limiter and no offshoot peak limiter.
- C. Provide Windows compatible software for set-up configuration.
- D. Frequency Response: Within plus or minus 1 dB from 20 to 20,000 Hz.
- E. Dynamic Range: 104 dB minimum weighted at 20 Hz to 2kHz.
- F. Equalizer: Provide nine (9) bands of parametric EQ with variable frequency, variable Q.
- G. Thresholds: Shall be -72dB to -1dB, 0.5dB resolution for Gate and Expander, AGC Leveler, Compressor and Limiter and No Overshoot Peak Limiter.
- H. Provide delay of upto 1.3 seconds at a resolution of 21 microsecond points in the processor.

~~I. Basis of design: Shure DP11EQ. Addendum 01~~

2.6 COMPONENTS

- A. Microphone: Comply with EIA SE-105.
 - 1. Type: Dynamic, with cardioid polar or omnidirectional characteristic.
 - 2. Impedance: 150 ohms.
 - 3. Frequency Response: Uniform, 60 to 12,000 Hz.
 - 4. Output Level: Minus 58 dB minimum.
 - 5. Finish: Satin chrome.
 - 6. Mounting: Desk stand with integral-locking, press-to-talk switch.
 - 7. Quantity of Microphones: Two.
 - 8. Quantity of Desk Stands: Two.
 - ~~9. Basis of Design: Shure Beta58A Addendum 01~~
- B. Portable Equipment Cabinet: Comply with EIA-310-D. Custom designed for housing of sound equipment for portable use.

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1. Cabinet Housing: Construct of 0.0478-inch (1.2-mm) steel, minimum, with front- and rear-locking doors and standard EIA 19-inch (483-mm) racks. Arrange for floor or wall mounting as required. Size to house all equipment indicated plus spare capacity. Include 20 percent minimum spare capacity for future equipment over and above space required.
2. Power Provisions: Install a single switch in cabinet to supply cabinet power distribution system and electrical outlets, uniformly spaced, to accommodate ac-power cords of each item of equipment.
3. Equipment: The cabinet shall house the Mixer/Pre-Amplifier, digital Processor, Power Amplifier, CD/Cassette Combo unit and a storage drawer for mics and accessories.
4. Rack Panel: A custom rack panel shall be fabricated for two (2) microphone inputs, one (1) auxiliary input and power own.
5. Ventilation: A low-noise fan for forced-air cabinet ventilation. Equip fan with a filtered input vent and connect to operate from 105- to 130-V ac, 60 Hz; separately fused and switchable and arranged to be powered when main cabinet power switch is on.
6. Power Sequencing: Shall be activated by the "Power On" switch located on the custom rack panel. Sequencing shall provide amplifier turn on as a last on/first off actuation. All power sequencing shall be housed in the portable equipment cabinet.
7. Operational characteristics: To become operation, the user will set the equipment cabinet adjacent to the pedestal providing AC power and speaker jacks; plug in the speaker outputs; plug in the microphones and plug in the power.
8. ~~Basis of design: SKB—Addendum 01~~

- C. Weatherproof Speaker Cabinets: 3-way, all horn-loaded loudspeakers designed to excel in both voice projection and high-fidelity music reproduction.
1. Speakers: High Output midrange drive dual 12" low frequency drivers and a 1" titanium high frequency driver.
 2. Frequency response: 70 – 18,000 Hz with sensitivity of 106 dB. Crossover points shall be at 600 Hz and 3500 Hz.
 3. Power handling: 400 watts nominal, 1000 watts peak.
 4. Grill: 16-gauge perforated steel with a foam and stainless mesh backing.
 5. Coverage patterns: Provide loudspeakers that offer five (5) unique coverage patterns over a wide frequency range for well defined coverage. Measure the dispersion coverage necessary to flood each bleacher section and provide the proper speaker cabinet.
 6. ~~Basis of design: Speaker cabinets shall be Community R2 Series loudspeakers complete with R2YOKE mounting bracket.—Addendum 01~~
 7. Quantity: Two (2).
- D. Custom Pole Mounts: Custom Stainless steel pole mounts.
1. Design: Custom mounts shall be custom designed for use with the R2 speaker cabinets. The rear resting plate shall fit snugly against the rounded pole. Secure the plate to the pole with stainless steel banding rated at least six (6) times load factor. All mounting hardware shall be stainless steel.
- E. Cable and Conductors: Jacketed, twisted-pair and twisted-multipair, untinned, solid-copper conductors.
1. Insulation for Wire in Conduit: CL2 rated as required by the National Electric Code.

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2. Microphone Cables: Two conductor twisted shielded 22 AWG minimum with shield No. 34 AWG tinned, soft-copper strands formed into a braid or approved equivalent foil. Shielding coverage on conductors is not less than 60 percent.
3. Speaker Cable: Two conductor No. 12 AWG minimum.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install equipment to comply with manufacturer's written instructions.
- B. Wiring Method: Install wiring in raceway except within consoles, desks, and counters. Conceal cable and raceway except in unfinished spaces.
- C. Wiring Method: Install wiring in raceway except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum-board partitions where cable wiring method may be used. Use plenum cable in environmental air spaces, including plenum ceilings. Conceal cable and raceway except in unfinished spaces.
- D. Install exposed cables parallel and perpendicular to surfaces or exposed structural members, and follow surface contours. Secure and support cables by straps, staples, or similar fittings so designed and installed to avoid damage to cables. Secure cable at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, or fittings.
- E. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess. Use lacing bars in cabinets.
- F. Control-Circuit Wiring: Install number and size of conductors as recommended by system manufacturer for control functions indicated.
- G. Separation of Wires: Separate speaker-microphone, line-level, speaker-level, and power wiring runs. Install in separate raceways or, where exposed or in same enclosure, separate conductors at least 12 inches (300 mm) for speaker microphones and adjacent parallel power and telephone wiring. Separate other intercommunication equipment conductors as recommended by equipment manufacturer.
- H. Splices, Taps, and Terminations: Make splices, taps, and terminations on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.
- I. Match input and output impedances and signal levels at signal interfaces. Provide matching networks where required.
- J. Identification of Conductors and Cables: Color-code conductors and apply wire and cable marking tape to designate wires and cables to identify media in coordination with system wiring diagrams.
- K. Wall-Mounting Outlets: Flush mounted.

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- L. Floor-Mounting Outlets: Conceal in floor and install cable nozzles through outlet covers. Secure outlet covers in place. Trim with carpet in carpeted areas.
- M. Conductor Sizing: Unless otherwise indicated, size speaker circuit conductors from racks to loudspeaker outlets not smaller than No. 12 AWG and conductors from microphone receptacles to amplifiers not smaller than No. 22 AWG.
- N. Weatherproof Equipment: Install units that are mounted outdoors, in damp locations, or where exposed to weather consistent with requirements of weatherproof rating.

3.2 GROUNDING

- A. Ground cable shields and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.
- B. Signal Ground Terminal: Locate at main equipment cabinet. Isolate from power system and equipment grounding.
- C. Install grounding electrodes as specified in Division 16 Section "Grounding."

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installations, including connections. Report results in writing.
- B. Operational Test: Perform tests that include originating program and page material at microphone outlets, preamplifier program inputs, and other inputs. Verify proper routing and volume levels and freedom from noise and distortion.
- C. Acoustic Coverage Test: Feed pink noise into system using octaves centered at 500 and 4000 Hz. Use a sound-level meter with octave-band filters to measure level at five locations in each zone. For spaces with seated audiences, maximum permissible variation in level is plus or minus 2 dB. In addition, the levels between locations in the same zone and between locations in adjacent zones must not vary more than plus or minus 3 dB.
- D. Power Output Test: Measure electrical power output of each power amplifier at normal gain setting at 50, 1000, and 12,000 Hz. Maximum variation in power output at these frequencies must not exceed plus or minus 1 dB.
- E. Signal Ground Test: Measure and report ground resistance at public address equipment signal ground. Comply with testing requirements specified in Division 16 Section "Grounding."
- F. Retesting: Correct deficiencies, revising tap settings of speaker-line matching transformers where necessary to optimize volume and uniformity of sound levels, and retest. Prepare written record tests.

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- G. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified. Prepare a list of final tap settings of paging speaker-line matching transformers.
- H. Schedule tests with at least seven days' advance notice of test performance.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain equipment as specified below:
 - 1. Train Owners maintenance personnel on programming equipment for starting up and shutting down, troubleshooting, servicing, and maintaining equipment.
 - 2. Review data in maintenance manuals. Refer to Division 1 Section "Contract Closeout."
 - 3. Review data in maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
 - 4. Schedule training with Owner, through Architect, with at least seven days' advance notice.

END OF SECTION 277281

SECTION 32 1900 — EXTERIOR ATHLETIC EQUIPMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. The provisions of the Contract Documents apply to this Section.

1.2 SUBMITTALS

- A. Materials and Equipment Lists: Submit a complete list of materials and equipment required. List shall include catalog numbers, catalog cuts, data sheets and such other descriptive information necessary to show that materials and equipment meet the requirements. No consideration will be given to partial lists submitted from time to time.
- B. Shop Drawings and Product Data: Submit drawings and product data as follows:
- C. Athletic equipment layout plan drawings showing each item in its exact location by dimensions, prepared to a minimum eighth-inch scale. Number equipment items to identify the equipment.
- D. Shop drawings and Product Data: Provide shop drawings (if not detailed in product data) and product data of each item showing materials and methods of construction.
- E. Sample warranties using manufacturer's standard forms for items cited.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Package materials for delivery in manufacturer's standard protective coverings. Cover and protect material in transit and at site. Material not properly protected and stored and which is damaged or defaced during construction shall be rejected.
- B. Do not deliver components or materials for interior athletic equipment installations to the project site until building is completely enclosed and weather tight. Do not deliver components or materials for exterior athletic equipment installations to the project site until related site preparation work is complete and related site locations are ready for installation of exterior athletic equipment. Store materials and components in secure spaces. Store materials and components neatly, properly stacked and covered with plastic.

1.4 WARRANTIES

- A. Provide warranties for the following items:
 - 1. Exterior Scoreboard and Exterior Timer: Provide manufacturer's minimum five (5) year warranty against defects in manufacture and materials covering full material replacement cost.
 - 2. Football Goal Posts: : Provide manufacturer's minimum five (5) year warranty against defects in manufacture and materials covering full material replacement cost

PART 2 – PRODUCTS

2.1 GENERAL

- A. Athletic equipment shall be standard production devices or systems of manufacturers successfully engaged in the manufacture of items (similar to those indicated) for a period of not less than five (5) years. Each equipment item type shall be a complete assembly and the product of a single manufacturer. Specific manufacturers' equipment models are referenced as a standard of design and quality. Complying products of other manufacturers may be considered in accordance with Contract Documents.

2.2 EXTERIOR SOCCER/FOOTBALL SCOREBOARDS

- A. General: Provide exterior soccer and football scoreboard (Fair-Play # FB-8120TK-2, or approved equivalent) with MP-53 Controller and case. Provide board in color as selected by Architect.
- B. Provide support for 100-mph wind. Include steel support posts with concrete footings, height of 10'-0" clear to bottom edge of scoreboard.
- C. Provide buried control cable to both control station and field with all necessary boxes, connectors, conduit, receptacles etc. for complete and fully functional system.
- D. Scoreboard electrical characteristics: 6 amps, 120/240 volts, 60 Hz, 646 Watts, 2W+G.
- E. Control center electrical characteristics: 10 watts, 120 volts, 60 Hz.

2.3 EXTERIOR FIELD TIMER

- A. General: Provide exterior field timer (Fair-Play # T-830-DISPLAY-2, or approved equivalent) with Controller and case. Provide board in color black.
- B. Provide support for 100-mph wind. Include steel support posts with concrete footings, height of 5'-0" clear to bottom edge of timer.
- C. Provide buried control cable to both control station and field with all necessary boxes, connectors, conduit, receptacles etc. for complete and fully functional system.
- D. Scoreboard electrical characteristics: 1 amp, 120/240 volts, 60 Hz, 104 Watts, 2W+G.

2.4 DISCUS/SHOT PUT

- A. Provide aluminum discus ring (Gill Athletics 375 – Discus Circle, or approved equivalent).
- B. Provide aluminum shot put toe board (Gill Athletics 364 – Aluminum Toeboard), or approved equivalent).
- C. Provide discus cage (Sportsfield Specialties 09172018 – High School Discus Cage with Backup Net System, or approved equivalent).
- D. Install in accordance with manufacturer's recommendations.

2.5 SOCCER GOALS

Portable Soccer Goals: NCAA regulation goals (Sportsedge SE700, or approved equivalent), with durable enamel or galvanized, steel tube or pipe frame, provide complete with soccer nets. Two sets of goals for the soccer field should be provided.

2.4 FOOTBALL FIELD GOAL POSTS

Aluminum, 20-foot high standards, 4 inch OD independently adjustable uprights, 6.625 inch diameter crossbar and gooseneck, with 8 foot offset; powder coated finish, yellow. Provide adjustable ground sleeves, hardware kit, wind directional flags, access frame kit. 2 per field. SportsEdge Model SEF305.

- A. Goal Post Protective Pads: 18 inch diameter by 6 foot high urethane pads with post cutout, 3/4 wrap, and 18 oz. vinyl covers. Velcro mounted. Color as selected by Architect from manufacturer's full line.
- B. Basis of Design: SportsEdge Model # SEF302
- C. Soccer Goal Access Frame: Nylon goal straps and aluminum anchors to anchor ground bar of soccer goal at base of football goal post gooseneck. 0.125-inch thick aluminum, 24.25-inch square, with four anchor bolts. Filler plugs/covers fabricated of pressure treated plywood, field wrapped in turf.
- D. Basis of Design: SportsEdge Model SEF390.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish anchorage devices with templates, diagrams and instructions for their installations, for athletic equipment indicated to be attached to (or cast in) concrete, masonry, and steel constructions. Coordinate delivery of these items to project site so as not to delay other work.
- B. Cover and protect all materials from damage and take proper precautions to protect all finished surfaces over which or against which athletic equipment must be installed. Repair or replace any damaged finished surfaces of the athletic equipment.

3.2 INSTALLATION

- A. General: Comply with manufacturer's detailed instructions in installing athletic equipment.
- B. Build in conduit for all electrical work, including power, cables, receptacles, motors, control wiring, key-operated switches, etc. as required for complete and functional system.

3.3 ADJUST AND CLEAN

- A. Clean up all debris, keeping the premises clean and neat at all times.

- B. Make necessary adjustment for safe, efficient operation of operable and electrical athletic equipment.

END OF SECTION 32 1900

SECTION 32 18 23.19 – SYNTHETIC TURF SYSTEM

1.01 SCOPE OF WORK

- A. This specification is for synthetic turf at Central Academy of Technology and the Arts\ Scope of work to include all labor, material, equipment, transportation and services to install complete new vertical draining synthetic turf field.
- B. It is the intent that the bidding general contractor employ one of the sports field manufacturers (see B.2) and a qualified sport field contractor to coordinate the installation of the synthetic turf. It is the general contractor's contract responsibility to furnish all labor, materials, testing, tools and equipment necessary to install, in place, all synthetic turf as indicated on the drawings and specified herein. It is acceptable for the turf manufacturer to act as the bidding general contractor as long as they are licensed for general contracting work in North Carolina under the correct classifications.
 - 1. Turf Systems: Hybrid Slit Film/Monofilament Turf System – 2.0 inch pile height.
 - 2. Approved Manufacturers Sport Turf Manufacturers:
 - a. Shaw Sports Turf
 - b. GreenFields
 - c. AstroTurf
 - d. FieldTurf
 - e. Sprinturf
 - f. No additional turf vendors/manufacturers will be accepted
 - 3. The installation of all new materials shall be performed in strict accordance with the manufacturer's written instructions and in accordance with approved shop drawings.
 - 4. The Sports Field Contractor shall be responsible for the turf base and final grade. Sports Field Contractor Installer shall be a single source responsible for both sub- grade and turf.
 - 5. Bidding contractor must submit solicited pricing sheets for all turf systems for owner review.
 - 6. Additional requirements can be found within this specification.
- C. Pricing Package
 - 1. Base Bid – Provide a 2.0" synthetic turf field system as defined in specifications installed on an aggregate base with a shock pad and associated drainage.
- D. Provide equipment and materials, and do work necessary to construct the synthetic field system, as indicated on the Drawings and as specified. Work shall include but shall not be limited to:
 - 1. Base Construction
 - a. Excavation, trenching, grading, backfilling, compaction to achieve subgrade as needed
 - b. Laser grading
 - c. Disposal of spoil materials off site.
 - d. Grade elevation verification of Finish Subgrade and acceptance prior to gravel install.
 - 2. Collector Drainage System Filter Fabric
 - a. Gravel drainage trench fill material.
 - b. Panel drain pipe, collector pipe and fittings

- c. Drainage stone base
 - d. Clean outs and inline structures/manholes
 - e. Grade elevation certification of finished stone base installation
- 3. Curbing/Fencing/Netting
 - a. Installation of perimeter curb/nailer system
 - b. Netting and Posts
- 4. Synthetic Turf Field
 - a. Synthetic Turf
 - b. Infill
 - c. Shock/Drainage Pad
 - d. Inlays, lines and logos.
 - e. Goal installation
 - f. Related finish work
- 5. As-built Drawings
 - a. Complete set of construction as-builts in CAD

1.02 RELATED WORK

- A. Review all Construction Documents for the following work-related items to be included in the project
 - 1. None

1.03 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirement shall govern.
 - 1. Drawings and the general provisions of the Contract, including General and Supplementary Conditions and other Division I Specification Sections, apply to this section.
 - 2. Installation shall comply with rules and/or regulations for field play set forth by the NFHS. Contractor to provide shop drawing striping plans for all fields prior to construction to ensure compliance.
 - 3. American Society for Testing and Materials (ASTM): Latest standard test methods for the products used for the synthetic turf product system, RCRA testing approved by the EPA. And, European Committee for Standardization of International Playing Surfaces EN 1177 for Head Injury Criteria.

1.04 SUBMITTALS

- A. Submittals for items required to be submitted with the Bid.
- B. All applicable manufacturer specifications
- C. The School requires that the field meet accessibility standards set forth and tested through ASTM 1951, Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment. While this project is obviously not a playground, the test methods and requirements set forth in ASTM 1951 shall be met for this product.
- D. Provide any perimeter edge / sideline drain detail / any sub drainage details, concrete curb border and turf nailer details, and sub-base recommendations as detailed and recommended by the manufacturer that vary from the details/specifications provided.

All details shall be CAD drawn at a scale 1"=20 or larger. All recommendations for approval by the Owner/Engineer/Landscape Architect

- E. Provide one (1) 12" x 12" boxed turf sample including infill representative of finished synthetic turf system.
- F. Main and Inlay Seams: One sample of both sewn and glued inlays per vendors/manufacture's instructions including written specifications.
- G. Signed public welfare and safety affidavit of heavy metal and containment free synthetic turf system.
- H. Digital .pdf copies of all third-party ASTM product data and testing documents stated in the specifications section demonstrating that proposed system meets or exceed all specified requirements Submit to Owner for approval. All testing shall be paid for by the Contractor.
- I. List of all company litigation in the last 10 years pertaining to synthetic turf construction. Includes litigation history for all associated subcontractors.
- J. Affidavit signed by an authorized representative of the Synthetic Turf Manufacturer attesting that the Sports Field Contractor is accepted and certified by the STM.
- K. Copy of standard eight (8) year warranty against workmanship and materials on the proposed synthetic turf
- L. Prior to the beginning of installation, the manufacturer/installer of the synthetic turf shall inspect the sub base, curb edge, nailer and under drain system and supply a Certificate of Subbase Acceptance for the purpose of obtaining manufacturer's warranty for the finished synthetic playing surface. Any discrepancies, other issues or if none are found this should be noted in the statement. This accepted certification will be added to all warranty information for validation purposes. All information to be reviewed by the Owner/Engineer/Sport Field Designer. Items to include;
 - 1. Permeability Rates
 - 2. Grade
 - 3. Compaction
 - 4. Statement of Suitability for turf installation
 - 5. Signed by the base contractor, turf manufacturer and turf installer.
 - 6. All testing shall be performed by a certified third-party independent lab and paid for by the Contractor.
- M. Submit a list of all material providers, including relevant contact information.
- N. Provide both a delivery and installation schedule.
- O. Provide a list and contact information of all subcontractors.
- P. Submit written statement signed by general contractor, synthetic turf manufacturer and installer that all drawings and specifications are in compliance with warranty requirements and are appropriate for the project at hand.
- Q. Subgrade, gravel drainage layer and field surface grades to verified by a North Carolina licensed surveyor
- R. The turf manufacturer shall submit a signed statement for the safety of their product regarding lead, heavy metals and other chemicals used in manufacturing of the product.
- S. Submit all compaction test results of the subgrade and gravel layer to conform

with drawings and specification requirements.

- T. Prior to Final Acceptance, the Contractor shall submit to the Owner three (3) hard copies and one (1) digital .pdf copy of Maintenance Manuals, which will include all necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including painting and striping.
- U. All required submittals listed within this specification. Please refer to each section for specific requirements.

1.05 SHOP DRAWINGS

- A. Shop drawings shall be prepared and contain all pertinent information regarding installation. These drawings shall be submitted to the Owner for approval prior to the manufacturing and shipment of materials.
- B. Submit drawings for;
 - 1. Seaming plan
 - 2. Striping, Logo and Endzone plan
 - 3. Manufacture installation details
 - 4. Details that may deviate from plan documents

1.06 QUALITY ASSURANCE AND WARRANTY

- A. Hold Harmless Clause
 - 1. The turf manufacture and sport field contractor shall indemnify the school and design team consultants from any potential patent and/or trademark infringements, litigation and or trade secret issues identified during the bid and construction process.
- B. Warranty
 - 1. The Contractor shall submit its Manufacturer's Warranty that guarantees the usability and playability of the synthetic turf system for its intended uses for a minimum eight (8) year period commencing with the date of Final Acceptance. The warranty coverage shall not be prorated nor limited to the amount of the usage. The warranty submitted must have the following characteristics:
 - a. Must provide full coverage for eight (8) years from the date of Final Acceptance.
 - b. Must warrant materials and workmanship.
 - c. Must warrant that the materials installed meet or exceed the product specifications.
 - d. Must have a provision to repair or replace such portions of the installed materials that are no longer serviceable to maintain a serviceable and playable surface.
 - e. Must be a warranty from a single source covering workmanship and all self- manufactured or procured materials.
 - f. Guarantee the availability of replacement material for the synthetic turf system installed for the full warranty period.
 - g. The Sports Field Contractor may be required, upon the request of the Owner, to provide a list of three (3) clients for which they have completed after-the-sale warranty work.
 - h. Any issues with type of shoe requirements for multi-sport play must be stated in the Warranty.
 - i. The 8-year warranty must also be supported by a 3rd party insured warranty

from an A-rated domestic insurance carrier. The value of the policy shall be no less than \$5,000,000 per occurrence, no deductibles allowed, with a total annual policy aggregate of \$10,000,000 renewed per each year of use. Only true 3rd party policies will be accepted. Companies submitting policies that are letters of credit or not truly a 3rd party insurance policy will not be accepted.

Submit three

(3) copies of the actual insurance policy.

- j. The 8-year warranty shall cover the following designated uses and associated wear characteristics for each sport use below
 - 1) NFHS Soccer
 - 2) NFHS Football
 - 3) NFHS Lacrosse
 - 4) Sport Camps
 - 5) General Recreation
 - 6) Special Events
 - 7) Pneumatic tire vehicle access
 - 8) Maintenance in accordance with manufacture recommendations

C. Maintenance

- 1. The Contractor shall supply the Owner with a written maintenance manual for proper care of the finished product. The maintenance manual shall specify any use limitations for the field (e.g. heavy vehicle traffic, etc.)

D. System Performance Characteristics

- 1. G-Max (shock attenuation) must test below 200 at installation.
- 2. The various Gmax Values should not vary each year by more than 10% above or below the average at time of installation for any individual drop.
- 3. Lifecycle Gmax Values: The maximum Gmax Value throughout the warranted lifecycle of the synthetic turf playing surface is not to exceed 165G.
- 4. The depth of the infill material shall be measured at each test location
- 5. All testing shall be performed by a certified third-party independent lab and paid for by the Contractor.
- 6. After the Contractor installs the system, he must guarantee that the field will meet the following performance criteria
 - a. Permeability (to ASTM D4491). The system shall allow a minimum percolation rate of 30 inches per hour.
 - b. Relative Abrasiveness (to ASTM F 1015). The system has an Abrasiveness Index of 20.2
 - c. Shock Absorbency (to ASTM F355, ASTM F 1936) Less than 165 G-Max for 8- year warranty.
 - d. Flammability (to ASTM D 2859).

1.07 PATENTS AND INFRINGEMENTS

- A. There are various established performance criteria throughout this specification and request for products and services. There may exist patent coverage for some means and methods of achieving those performance criteria. Bidders are responsible for ascertaining that means and methods of the products and services that they are providing are not being provided in violation of any such patent rights. Bidder's responsibilities are as follows:

1. To hold harmless, the Owner, the Landscape Architect and all Project Consultants, as to any violation to include dollar amounts that could be owed as a result of damages for infringement including potential treble damages as provided for under U.S. Patent Law.
2. Any and all costs that the Owner, the Landscape Architect and all Project Consultants would incur in replacing materials and services which are determined to infringe patent rights.
3. All administrative, legal and other costs that would be incurred as a result of an infringement.
4. If any product or services proposed to be provided by the Bidder are known by the Bidder to be subject to any existing claims of infringement, Bidder shall notify the Owner and the Landscape Architect of such claim and provide evidence of financial ability to perform on the above hold-harmless requirements.

1.08 COMPLETION AND ACCEPTANCE

- A. Punch list shall be scheduled at least 10 days before the Substantial Completion Date.
- B. Owner shall be notified of the Punch List date 10 days before planned occurrence in writing.
- C. All items to be installed and in working order prior to Punch List request.
- D. After Punch List items are corrected, the contractor shall notify the owner for "Substantial Completion" 10 days prior.

PART 2 PRODUCTS

2.01 SYNTHETIC TURF PRODUCT

- A. Base Bid – Provide a 2.0" synthetic turf field system as defined in specifications installed on an aggregate base with a shock pad and associated drainage.

	<u>Turf Requirements:</u>	<u>Description</u>
1.	Turf Type	Dual Fiber (Slit Tape/Mono Hybrid)
2.	Base Turf Color	Alternating Green Panels
3.	Pile Height	2.0"
4.	Exposed Fiber Height	Per Manufacturer Specifications
5.	Pile Yarn	UV Resistant Polyethylene
6.	Slit Tape Fiber	XP Blade + or Equal
7.	Mono Fiber Type	Ridged
8.	Face/Pile Weight	46 oz per SY Min.
9.	Primary Backing	7 oz/SY Min.
10.	Primary Backing UV Stabilizer	1000 hours of QUV A testing
11.	Secondary Backing	20 oz/SY Min.
12.	Total Carpet Weight	73 oz/SY Min.
13.	Machine Gauge	Per Manufacturer Specifications
14.	Tuft Bind	Min. 8lbs without infill, 10lbs with infill
15.	Grab Strength	> 200 lbs avg.
16.	Grab Tear Width	> 200 lbs avg.

17.	Pill Burn Test	Pass
18.	Shock/Drainage Pad	Brock SP17 XL
19.	Infill Mix	SBR 50% Sand 50% if Pad is Accepted
20.	Infill Mix	SBR 70% Sand 30% if Pad is not Accepted
21.	Infill Rubber Granule Comp	SBR Rubber
22.	Infill Rubber Spec. Gravity	1.1 min to 1.2 max
23.	Infill Rubber Ash Content	Between 5% and 15%
24.	Infill Rubber Sieve Analysis	10 / 20 Mesh (2.0mm - 0.85mm)
25.	Infill Sand Granule Shape	Semi-rounded to rounded angularity
26.	Infill Sand Sieve Analysis	20 / 40 Mesh (0.85mm - 0.425 mm)
27.	Infill per SF	Min. 5.0 lbs
28.	Infill Depth	+/- 1.5"
29.	Fabric Width	15'-0
30.	Yard Denier Slit Film	5,000 Min.
31.	Yard Denier Mono	10,000 Min.
32.	Breaking Strength	18 lbs/sf
33.	Yarn Melting Point	246 degrees

- B. Full color logos, letters and field colors to be provided as shown in the plan set.
- C. All vendors must submit a turf spec sheet prior to final approval after bid.
- D. The Secondary Backing of high-grade polyurethane shall be applied to the Primary Backing. The tuft bind shall be a minimum average of 8 lbs. without infill and 10 lbs. with infill.
- E. Turf products with permeable backing do not require perforations.
- F. All perforations shall be unobstructed.
- G. Turf products with a coated or non-drain thru backing must include perforations in the backing.
- H. All turf carpet and infill material shall be provided by a single source and documented accordingly.
- I. All inlaid lines will be tufted in the factory to the extent practical. All widths of lines per NFHS rules.
- J. All seams shall be flat, tight, and permanent with no separation or fraying.
- K. Carpet rolls shall be 15-foot widths.
- L. The finished surface shall function as a grass field with similar natural playing grass field characteristics.
- M. The use of all conventional athletic shoes shall be allowed and identified in the warranty specifications.
- N. All components and their installation method shall be designed and manufactured for use on outdoor athletic fields. The materials as hereinafter specified should be able to withstand full climatic exposure in all climates, be resistant to insect infestation, rot, fungus, mildew, ultraviolet light and heat degradation, and shall have the basic characteristics of flow-through drainage, allowing free movement of surface runoff through the synthetic turf fabric where such water may flow to the existing base and into the field drainage system.

- O. The finished playing surface shall appear as mowed grass with no irregularities and shall afford excellent traction for conventional athletic shoes of all types. The finished surface shall resist abrasion and cutting from normal use.
- P. Sew or glue seam turf as recommended by the synthetic turf manufacturer.

2.01 INFILL (SAND AND SBR RUBBER – BASE BID)

- A. Infill should be a combination of 50% SBR and 50% Sand.
- B. The crumb rubber shall have a specific gravity range from 1.1 minimum to 1.2 maximum as determined by ASTM D 297 (including any modifications made by ASTM in the future).
- C. The crumb rubber shall have an ash content of between 5 and 15% as determined by ASTM D 297 (including any modifications made by ASTM in the future).
- D. The crumb rubber shall not contain more than .01% (of the total weight of crumb rubber) liberated fiber (no more than 0.6 lbs per ton) tested per ASTM D 5603.
- E. The infill materials shall conform to the synthetic turf vendor's standard specifications and warranty.
- F. All sand infill to have clean rounded particles and meet manufacturer's requirements.

2.02 SHOCK DRAINAGE PAD/RESILIENT UNDERLAYMENT PAD

- 2.02.1 Infill shall be 50% SBR 50% Sand with shock drainage pad.
- 2.02.2 Brock SP17XL or approved alternate
- 2.02.3 ShockBase Select is an approved alternate
- 2.02.4 See specification 322200 Resilient Underlayment Pad
- 2.02.5 Install per manufactures recommendations.

2.03 GEOTEXTILE

- 2.03.1 Geotextile Filter Fabric for the Subgrade and Collector Drainage: Non-woven polypropylene geotextile fabric shall be chemically and biologically inert. The subgrade shall be covered in its entirety with a geotextile fabric meeting the following specifications. The geotextile shall be woven from high-tenacity long-chain synthetic polymers composed of at least 95 percent by weight of polyolefins or polyesters and pass a minimum of 135 gpm. They shall form a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including selvages
- 2.03.2 Geotextile for the subgrade shall have minimums:
 - 2.03.2.1 Mass/Weight of 4.5oz oz/yd²
 - 2.03.2.2 Flow rate 135 gal/min/ft²
 - 2.03.2.3 Permivity 1.8 cm/sec
 - 2.03.2.4 Tensile Strength 120 lbs
 - 2.03.2.5 Elongation 50%
 - 2.03.2.6 Trapezoid Tear Strength 50lbs
 - 2.03.2.7 Apparent Opening Size 70 US Sieve
 - 2.03.2.8 UV Resistance 70/500 % hours

- 2.03.2.9 Mass/Weight of 3.2oz oz/yd²
- 2.03.2.10 Flow rate 95 gal/min/ft²
- 2.03.2.11 Permivity 1.3 cm/sec
- 2.03.2.12 Tensile Strength 110 lbs
- 2.03.2.13 Elongation greater than 50%
- 2.03.2.14 Trapezoid Tear Strength 40lbs
- 2.03.2.15 Apparent Opening Size 50 US Sieve
- 2.03.2.16 Geotextile for the stone base shall be approved by the Shock/Drainage Pad manufacturer to confirm compatibility.
- 2.03.3 Provide geotextile on field subgrade, top of finished stone layer and collector drainage trenches
- 2.03.4 Secure geotextile to subgrade with staples as recommended by the manufacturer.

2.04 DRAINAGE PIPE, PANEL DRAIN AND COLLECTOR PIPE.

- 2.04.1 Drainage Pipe: A network of perforated HDPE highway grade drainage pipe (1" x 12" flat panel pipe) shall be installed under the free draining base aggregate. The drainage pipe and perimeter collector lines will be sized and installed per manufacturer recommendations.
- 2.04.2 Perforated pipe shall be double wall high-density polyethylene pipe (HDPE) and shall conform to all associated AASHTO requirements.
- 2.04.3 HDPE Perforated pipe shall Class have 2 slotted perforations in accordance with associated AASHTO requirements.
- 2.04.4 Solid wall pipe shall be high-density polyethylene pipe (HDPE) and shall conform to associated AASHTO requirements.
- 2.04.5 Underdrain Panel Drains and Fittings shall be 1"x12" wide flat panel composite pipe
 - 2.04.5.1 Advandeg 12" Width
 - 2.04.5.2 MultiFlow 12" Width
 - 2.04.5.3 J-Drain
 - 2.04.5.4 Approved Alternate
- 2.04.6 The panel drain core shall have a minimum in-plane flow rate of 170 gpm/ft width at 3600 psf and a hydraulic gradient of 1.0, per ASTM D-4716. The core shall have a minimum compressive strength of 7,500 psf.
- 2.04.7 Corrugated panel drain shall conform to the requirements for Class B Geocomposite as defined in ASTM D7001-06.
- 2.04.8 Provided panel drain complete with all fittings such as bends, reducers, adapters, couplings, collars, and joint materials. All fittings shall be supplied by the same manufacturer as the panel drain.
- 2.04.9 Inline structures only are to be used for collector drains. Risers with fittings are not allowed.
- 2.04.10 Collector basins/cleanouts to be Nyloplast or approved equal with solid grates

2.05 STONE BASE COURSE

- 2.05.1 Stone Base Courses: The following gradation of stone is a typical and recommended specification. The Synthetic Turf Base Contractor is required to focus

on achieving the planarity, porosity and compaction requirements to provide a sound crushed stone base for synthetic turf installation. The free-draining base aggregate base layer shall consist of a consistent depth of open graded material. Base drainage aggregate used must achieve a 95% minimum overall compaction rate.

2.05.2 Material shall conform to the AASHTO #57 and #78 classifications. Local or regional stone specifications that meet, sieve, compaction and porosity requirements are permitted, but must be approved by the designer prior to construction.

2.05.3 The stone base shall conform to the turf vendor's standard specifications subject to the Designer's approval and meet the following requirements using ASTM Method C136: The open graded aggregate material shall conform to the following criteria:

#78 Finish Stone	
Sieve Size	% Passing by Weight
3/4"	100
1/2"	98-100
No. 4	20-45
No. 8	0-15

#57 Free Draining Base Stone	
Sieve Size	% Passing by Weight
1-1/2"	100
3/4"	95-100
1/2"	25-60
No. 4	0-10
No. 8	0-5

2.05.4 All stone shall be angular. Rounded or river stone is not acceptable.

2.05.5 In no instance, shall multiple quarry sources be used within a single playing field area. Bridging Characteristics:

2.05.5.1 $3 < \frac{D_{85} \text{ base stone}}{D_{15} \text{ top stone}} < 6$

2.05.6 All stone shall be angular. Rounded will not acceptable.

2.05.7 The stone material shall be AASHTO#57 and #78. Material must be clean.

- 2.05.8 In no instance, shall multiple quarry sources be used within a single playing field area.
- 2.05.9 All stone shall be angular. Rounded or river stone is not acceptable.
- 2.05.10 Stone shall not come from multiple source locations.
- 2.05.11 Permeability for base stone shall be greater than 50"/hr.
- 2.05.12 Permeability for combined stone sections shall be greater than 30"/hr.

2.06 PRESSURE TREATED NAILER

- 2.06.1 A pressure treated 2" x 4", or equivalent nailing strip shall be used.

2.07 FIELD CONCRETE CURB

- 2.07.1 Anchor attachments shall be approved by the manufacture for concrete setting.
- 2.07.2 Concrete curbing shall have appropriate control and construction joints installed per specifications
- 2.07.3 Concrete shall 4000 PSI minimum.
- 2.07.4 Field curb shall be designed to contain all infill within the curb line.

PART 3 EXECUTION

3.01 GENERAL

- A. The installation shall be performed in full compliance with approved shop drawings.
- B. Only factory-trained technicians skilled in the installation of synthetic turf systems shall undertake the placement of the system.
- C. The surface to receive the synthetic turf shall be inspected and certified by the manufacturer as ready for installation of the synthetic turf system and must be perfectly clean as installation commences and shall be maintained in that condition throughout the process.
- D. The turf system shall be fibrillated only after the infill material is installed with a machine specifically designed to do so. All contactors shall be familiar and understand all drawings and specifications for the work prior to beginning construction.
- E. All work shall be protected from inclement weather conditions.
- F. Verification of Conditions: Examine areas and conditions under which all work of this Section is being performed. Do not proceed with any work until unsatisfactory conditions have been corrected. Commencement of work implies acceptance of all areas and conditions.
- G. Site shall be secure to limit unauthorized personnel access and measures taken to protect all workers.
- H. Unanticipated Conditions: Notify the Engineer immediately upon finding evidence of previous structures, filled materials that penetrate below designated excavation levels, or other conditions which are not shown or which cannot be reasonably assumed from existing surveys and geotechnical reports. Secure the Engineer's instruction before proceeding with further work in such areas.
- I. The Project Superintendent 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.

3.02 INSTALLATION LIMITATIONS

- A. Installation shall not proceed when: Ambient air temperature is below 50 degrees F. Material temperature is below 50 degrees F. and when rain is falling or pending, unless acceptable to qualified installers.
- B. Site conditions exist, or are pending, that will be unsuitable for the installation of the system.

3.03 SUBGRADE AND EARTHMOVING

- A. Establish required lines, levels, contours and datum. Contractor responsible for work shall coordinate and ensure that the final grades of subgrade, stone base and playing surface meet the established design requirements.
- B. Maintain all benchmarks and other elevation control points. Re-establish, if disturbed or destroyed, at no additional cost to the Owner.
- C. Locate all utilities before grading. Coordinate with the Owner.
- D. If groundwater levels are sufficiently high, provide pumps in sumps as required maintaining groundwater at a minimum depth of two feet below excavation bottom at all times. Maintain dry conditions until completion and acceptance of the base, prior to synthetic turf placement.
- E. Monitor groundwater during construction.
- F. Prevent surface water from infiltrating and damaging the subgrade and stone base.
- G. There shall be no ponding on site at any time.
- H. For all excavation requirements procedures refer to geotechnical report and Earthmoving specification.
- I. For all structural fill requirements and procedures refer to geotechnical report and Earthmoving specification.

3.04 SUBGRADE SLOPES AND FINAL GRADES

- A. Final subgrade grades shall conform to the lines and grades shown on the drawings. The measured grades shall not deviate more than 0.04 feet from the planned grades and not vary more than 0.04 feet in 25 feet in any direction. Laser grading is required.
- B. Subgrade shall mirror the final finish elevation of the field surface in regards to slope except where noted on the drawings.
- C. All surfaces shall be graded to drain to drainage structures with no ponding. Grading tolerances given above do not relieve the Contractor from this requirement.
- D. All subgrade grades shown on the drawings shall be completed by the Contractor and inspected. If survey is required for finish grades all testing and special inspections shall be by the contractor
- E. The aggregate subbase will need to be inspected and accepted by the Engineer and Synthetic Turf Installer prior to synthetic turf installation.
- F. Playing Field Subgrade elevation verification: A certified survey by a State licensed land surveyor shall be performed at 25-foot centers for each field to verify grade and elevation of the subgrade. The survey shall indicate spot elevations and tenth of foot contours.
- G. Playing Field Finish Stone elevation verification: A certified survey by a State licensed

land surveyor shall be performed at 25-foot centers for each field to verify grade and elevation of the subgrade. The survey shall indicate spot elevations and tenth of foot contours.

3.05 SUBSURFACE DRAINAGE

- A. All subsurface laterals shall be designed by contractor's engineer, and installed per manufacture recommendations
- B. Only perform trenching, drainage pipe installation and backfilling operations that can be completed in one day. Exposed trenches that collapse due to rain or other occurrences shall be widened and filled as specified or refilled with subgrade materials, compacted, and retrenched.
- C. Lay perforated collector pipe in accordance with pipe manufacturer's recommendations. Provide collars and couplings as required for installation of this line and for connection with panel drains.
- D. Lateral drain lines size to be determined by manufacture recommendations
- E. Laterals shall be buried in a pea gravel like materials
- F. Laterals shall have a minimum of 3" of clean materials below the pipe, above subgrade materials.
- G. Lateral lines shall NOT, be covered by a geotextile fabric. If geotextile is required by permitting, it shall only be on sides, and bottom of lateral line trench. Covering of top of lateral drainage trench shall not be permitted.
- H. Connect panel drains to collector/header piping using panel drain manufacturer provided fittings, per manufacturer instructions and as shown on drawings.
- I. All panel drains shall be attached to form a continuous drain. Refer to manufacture specifications regarding connection procedures and requirements for panel drain field connections.
- J. Collector drains shall be installed per the slopes designed by the contractors' engineer. Pipes shall be installed, connected and fully mudded into any and all catch basins, or drop boxes designed.
- K. All pipes shall be installed per slopes and grades shown on contractors approved plans, shop drawings, and permitted drawings.
- L. Remove all spoils associated with trenching offsite at contractor's expense.

3.06 TURF NAILER

- A. A pressure treated wood 2" x 4", or equivalent nailing strip shall be used.
- B. Specifications and shop drawings for nailer and anchors shall be submitted Synthetic Turf Manufacturer (STM) for review and approval prior to contractor installation.
- C. After installation of the concrete curbing the contractor shall install the nailer, prior to final placement of the top stone rock for synthetic turf base.
- D. Nailer shall be installed using concrete anchors as specified by the Synthetic Turf Manufacturer (STM)
- E. Nailer shall be anchored at both end of board, and every 2' along entire length of product installed.

- F. Nailer shall be installed to an approved dimension below grade, as specified by the synthetic turf carpet supplier. Contractor shall verify finish grade of nailer with turf contractor.
- G. Any anchors that do not fully drive into concrete shall be removed and new anchor installed adjacent on either side of the previous anchor that failed to install fully.

3.07 CONCRETE CURBING

- A. Clean existing concrete surfaces thoroughly before placing abutting fresh concrete.
- B. Concrete curbing for synthetic turf shall be per plan details. Finish shall be medium broom.
- C. Concrete curbing shall have appropriate control, expansion and construction joints installed per details.
- D. All curbing adjacent to walls and buildings shall have expansion joints.

3.08 GEOTEXTILE FABRIC

- A. The geotextile shall be laid smooth without wrinkles or folds on the prepared subgrade in the direction of construction traffic.
- B. Adjacent geotextile rolls shall be overlapped. Overlaps shall be in the direction as shown on the plans and in accordance with the manufacturer's requirements. The lateral seam shall have a minimum overlap of 24"
- C. Dimensions to be a minimum width of 10' and minimum continuous length of 150'
- D. Attached to subgrade per manufacture specifications/recommendation.

3.09 SUBGRADE ESTABLISHMENT

- A. The subgrade shall be excavated to create a positive slope towards the subsurface drainpipes at greater than .5% for the outdoor field.
- B. No work shall be completed in this section until subgrade is 100% completed and accepted by the Landscape Architect and Owner or their representative.
- C. Following rough grading of the subgrade, the exposed soil shall be moisture conditioned to near the optimum moisture content and compacted to at least 90 percent relative compaction (modified proctor) to produce a firm non-yielding surface.
- D. Subgrade after compaction and inspection shall be covered with an approved geotextile fabric between all drain line locations. Fabric shall be non-woven, and be approved.
- E. Loaded trucks shall not be permitted to drive over fabric surface until the base aggregate has been placed accordingly.
- F. All aggregate layers to be compacted to a minimum 95% of maximum dry density compaction rates.

3.10 SITE PREPARATION

- A. The Contractor shall strip all debris and organic matter from areas to be graded for the synthetic turf base.
- B. All drain line spoils shall be removed from subgrade and all subgrade areas shall be rolled and compacted to 95% and compaction test results submitted to Synthetic Turf Contractor, Owner and Engineer/Landscape Architect for approval and for the records.

3.11 COMPACTED FILL

- A. Place and compact approved fill material in accordance with the specifications

and drawings.

- B. No fill shall be compacted during periods of rain or on ground that is saturated or has standing water. Soil that has been over-saturated by rain or any other means shall not be used until the moisture content is within limits required by the Owner and Engineer
- C. PERMEABLE BASE AND TOP STONE
- D. The specified base stone shall be carefully placed and compacted over the subgrade and/or drainpipe to the grades and elevations shown on the drawings. If the thickness of the planned base stone exceeds 6 inches, the stone shall be placed in horizontal layers not to exceed 6 inches and each layer proof rolled to 95 percent relative compaction (modified proctor) with a vibratory smooth drum roller. Testing shall be done using the nuclear method.
- E. Moisture Content of the stone shall be 4% - 7% of dry weight to ensure no migration of fines during transport and installation. Installation of base stone shall not be permitted during periods of heavy rainfall or moisture. Segregation of fines during transport and stockpiling. will not be acceptable. Field specialty contractor is to apply water during construction to keep proper moisture content. In case of inclement weather contractor is to protect stone already on site and in place to ensure fines do not wash out of materials. This means covering all work with visquine and sandbags or other means to keep visquine in place during weather.
- F. Each layer of materials shall be uniformly spread and not move more than 10' from location of import onto site. Any rock materials that are seen to have been worked more than once with equipment shall be removed.
- G. Base stone for the synthetic field shall be placed to a ~~6"~~ 4" compacted thickness. Unless otherwise indicated on drawings.
- H. Top stone for the synthetic turf field to be 2" compacted depth. Approval of the subgrade fill materials shall be completed and tested for compaction prior to any work being done in this area.
- I. Finished surface shall be proof rolled with a vibratory smooth double drum roller to provide a non-yielding, smooth, flat surface. Compaction must be to 95%-modified proctor. Modified proctor testing per current ASTM standards is required. Submit testing procedure to geotechnical engineer for approval.
- J. Final crushed rock base grades shall conform to the lines and grades shown on the drawings. The measured grades shall not deviate more than 0.04 feet from the planned grades and not vary more than 0.04 feet in 25 feet in any direction. Laser grading is required.
- K. The top surface of the base stone shall be flat from the centerline toward the sideline as shown on the drawings.
- L. All base stone grades shown on the drawings shall be completed by the Contractor and inspected by the Landscape Architect and synthetic turf representative prior to commencing with the subsequent work items.
- M. Both base stone and finish stone is subject to Testing for Water Permeability of Synthetic Turf Systems and Permeable Bases (ASTM F1551) at six (6) locations on the outdoor field.

3.12 PERMABILITY REQUIREMENTS

- A. All systems collectively shall drain vertically a minimum of 30" of rain per hour with no signs of visible ponding

3.13 SYNTHETIC TURF

- A. 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.
- B. Turf panels shall either be glued or sewn together.
- C. Glued Seams: Panels glued together at the seams using the latest state of the art procedures approve by the manufacturer. Seams shall be adhered using reinforcing tape and high-grade adhesive approved by the manufacturer. All seams shall be transverse to the field direction; i.e., run perpendicularly across the field. Seams shall be flat, tight, and permanent with no separation or fraying.
- D. Sewn Seams: Utilizing standard state of the art sewing procedures, each roll shall be attached to the next. Each seam will be stitched using cord as approved by the manufacturer. When all of the rolls of the playing surface have been installed, the sideline areas may be installed at right angles to the playing field turf

3.14 REPAIR MATERIALS, GROOMER AND SWEEPER

- A. Upon Final Acceptance, the turf Contractor shall provide to the Owner the following items in the minimum quantities specified:
- B. 200 SF of attic stock of base field green turf.
- C. 50 LF of seaming tape and epoxy
- D. 200 SF of Additional Pad
- E. Provide combination integrated groomer/sweeper or separate groomer and sweeper. To be verified accepted as appropriate equipment under turf warranty.
- F. Provide specifications for type of field utility vehicle tires allowed on the field. Includes this provision in the warranty.

3.15 MAINTENANCE TRAINING

- A. The Sports Field Manufacturer will be responsible for training the Owners selected personnel regarding the maintenance and upkeep of the field upon completion. The Sports Field Contractor is responsible for scheduling this event and obtaining written confirmation and acceptance of the scheduled time from the owner.

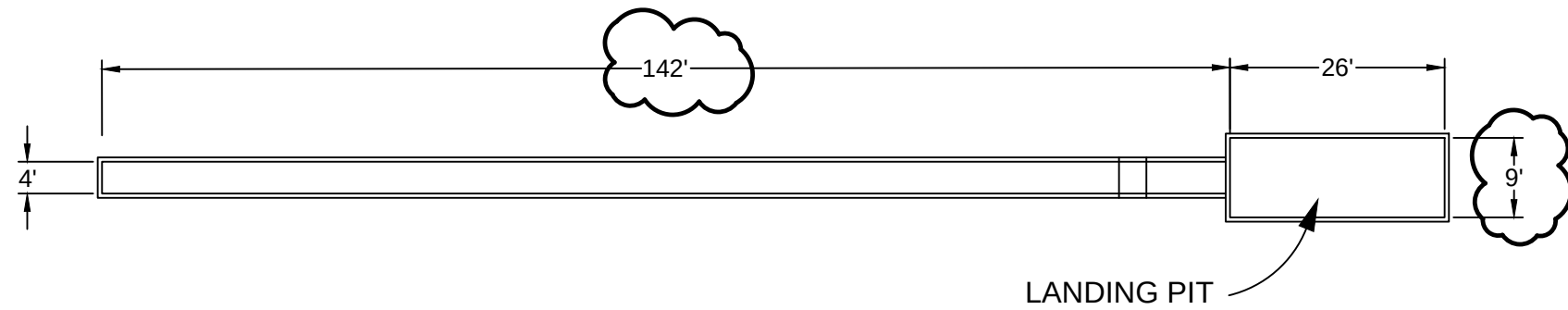
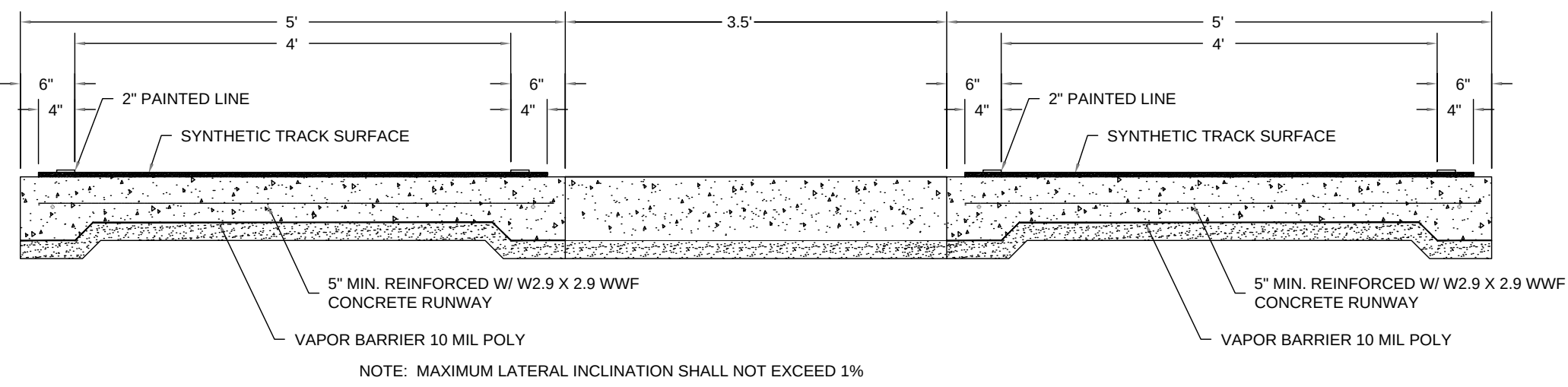
3.16 REQUIRED PERFORMANCE G-MAX TESTING

- A. At Final Acceptance the Sports Field Manufacturer shall, as specified, hire an independent testing laboratory to perform G-max testing (ASTM 355, 1936 method, testing at a minimum of 8 locations including heavy wear areas to verify that the shock attenuation properties of the field meet the requirements set forth in this specification.
- B. The Owner reserves the right to have the field tested for shock attenuation at its own cost at any time it deems necessary. If at any time the G-max ranges reach unacceptable levels, it is the responsibility of the Sports Field Contractor to bring the field back into the required ranges at no cost to the Owner.
- C. At any time, should the Sports Field Contractor fail to provide an independent third party Gmax test that confirms an average Gmax value of 200G or lower, then the Sports Field Contractor will be solely responsible for the remove and dispose of the

existing field surface, and the full installation of a new synthetic turf playing surface that meets all the specifications of the original bid documents and is independently tested to be safe by the original Gmax-Shock Attenuation requires as listed within this section.

- D. Submit a pdf copy of the test report findings to the Owner at the completion of each test.

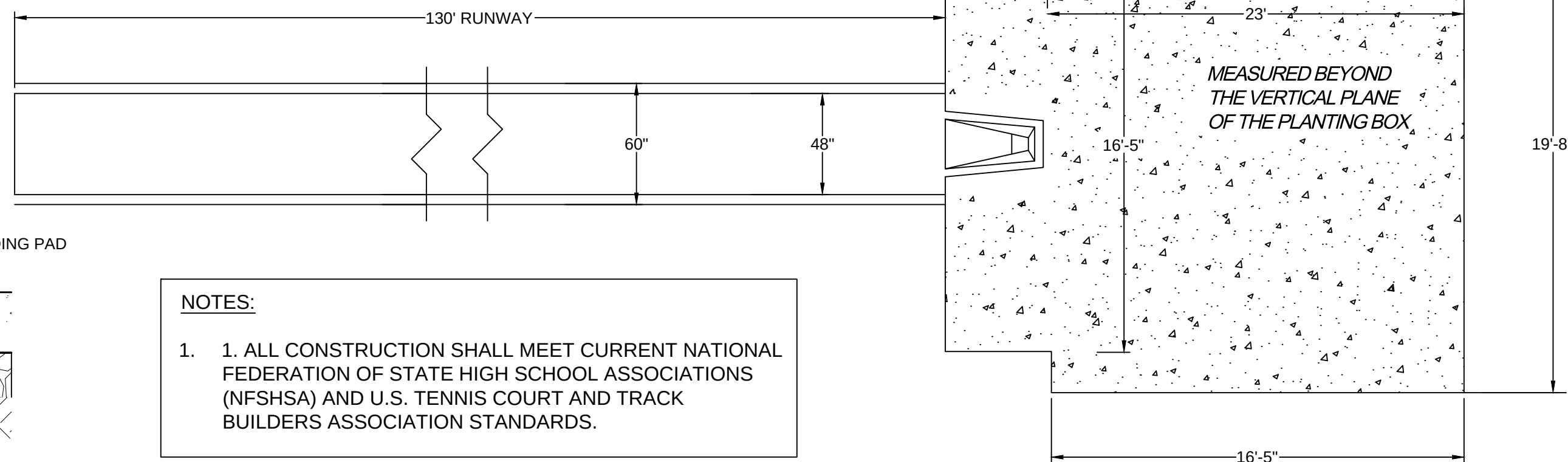
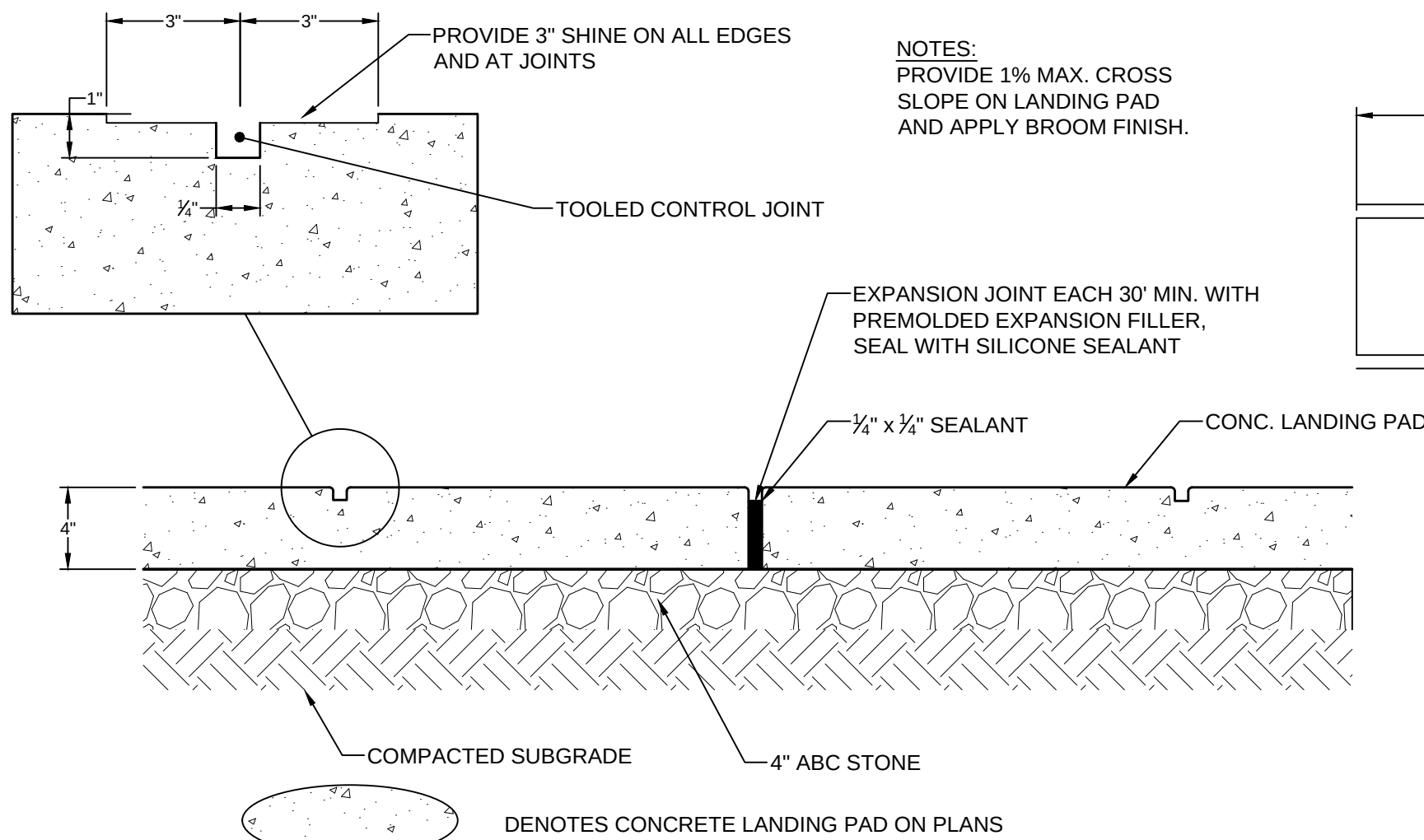
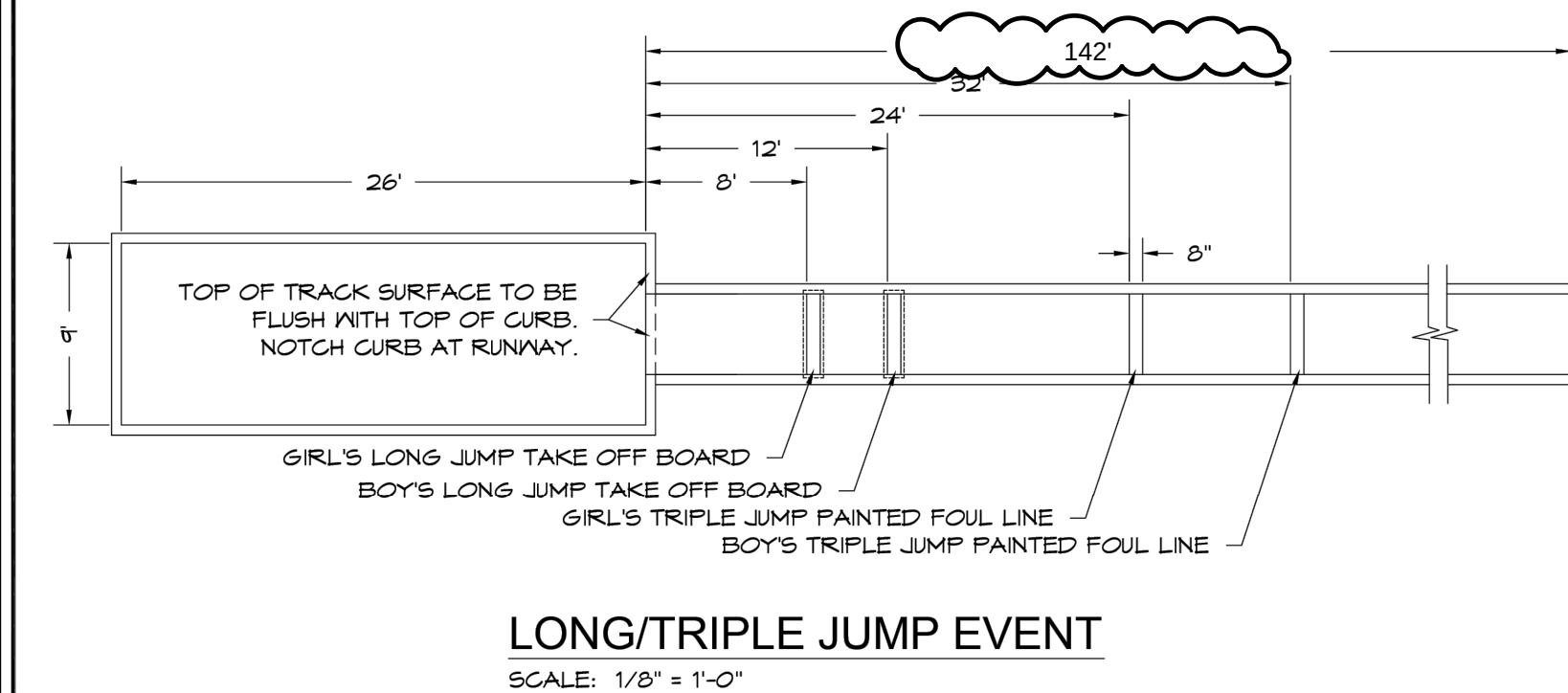
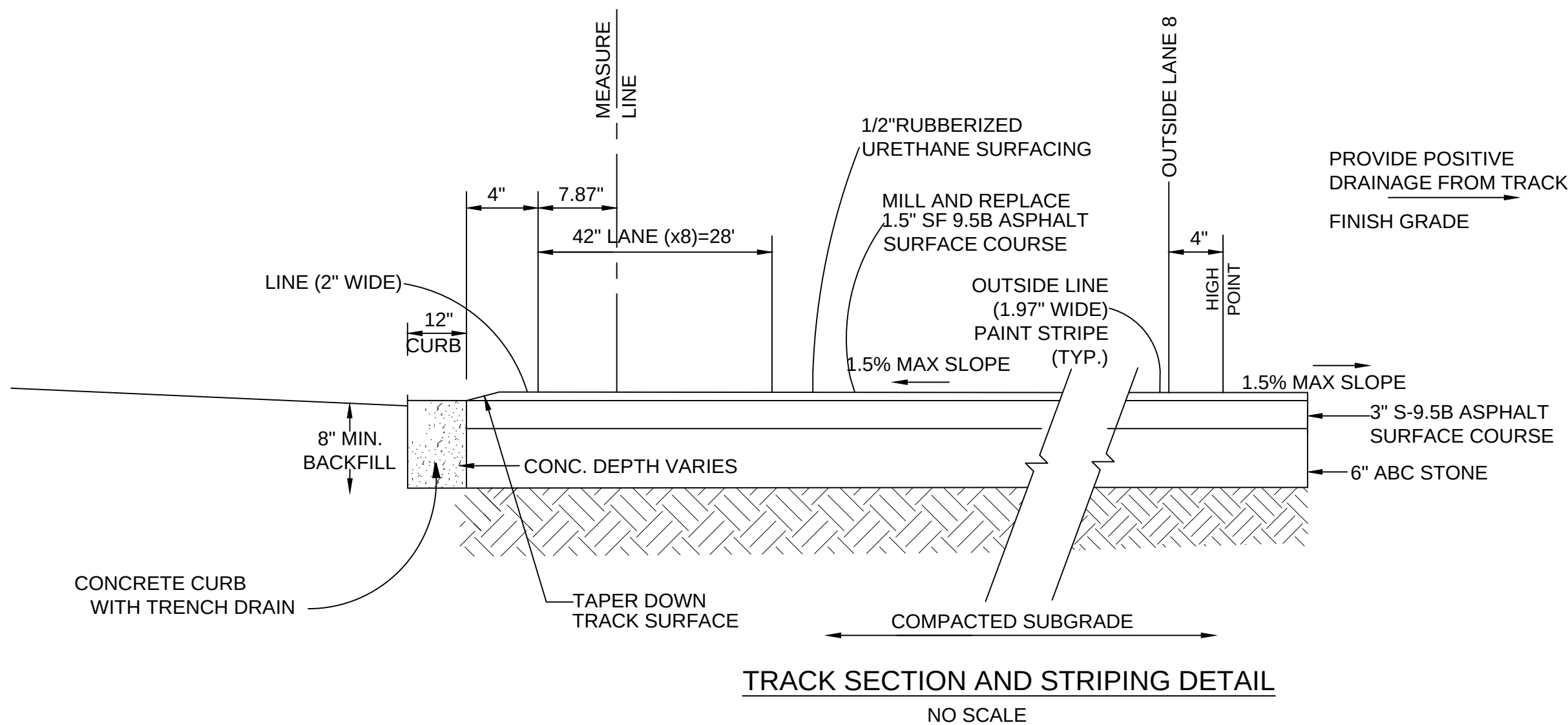
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SCTRATCH LINE LOCATION (MEASURED FROM THE NEARER EDGE OF THE LANDING PIT)		
	BOYS	GIRLS
LONG JUMP	12 FEET	8 FEET
TRIPLE JUMP	32 FEET	24 FEET

- NOTES:
1. ALL CONSTRUCTION SHALL MEET CURRENT NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS (NFSHA) AND U.S. TENNIS COURT AND TRACK BUILDERS ASSOCIATION STANDARDS.
 2. REFER TO SPECIFICATION SECTIONS 321800 AND 325000.
 3. COORDINATE WITH SCHOOL ATHLETIC DIRECTOR PRIOR TO STRIPING.

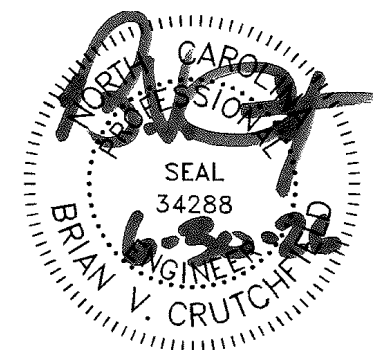
NOTE: DISTANCE FROM SCRATCH LINE, MAY BE ADJUSTED TO ACCOMMODATE DIFFERENT LEVELS OF COMPETITION.



- NOTES:
1. ALL CONSTRUCTION SHALL MEET CURRENT NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS (NFSHA) AND U.S. TENNIS COURT AND TRACK BUILDERS ASSOCIATION STANDARDS.



1. CONTRACTOR IS FULLY RESPONSIBLE FOR CONTACTING APPROPRIATE PARTIES AND ASSURING THAT EXISTING UTILITIES ARE LOCATED PRIOR TO CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR PLACING BARRICADES USING FLAG MEN, ETC. AS NECESSARY TO INSURE SAFETY TO THE PUBLIC.
3. ALL PAVEMENT CUTS, CONCRETE OR ASPHALT, ARE TO BE REPLACED ACCORDING TO STANDARDS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION AND TOWN OF WEDDINGTON SPECIFICATIONS.
4. SHORING WILL BE ACCORDING TO OSHA TRENCHING STANDARDS PART 1926 SUBPART F, OR AS AMENDED.



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REVISION DESCRIPTION	
ADDENDUM 1	
DATE	6/30/26

DATE	05 JUNE 2026
DRAWN BY	J. HASNER
DESIGNED BY	J. HASNER
CHECKED BY	B. CRUTCHFIELD
SCALE	

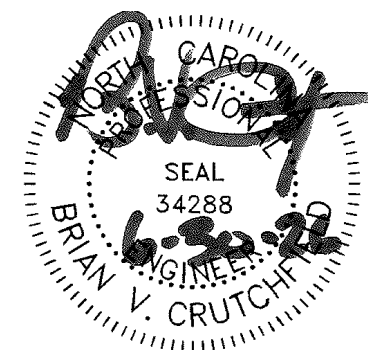
TIMMONS GROUP

CATA - TRACK & FIELD REPLACEMENT
CITY OF MONROE, NORTH CAROLINA

JOB NO.	76043
SHEET NO.	C-400

NOTES AND DETAILS

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CATA - TRACK & FIELD REPLACEMENT
CITY OF MONROE, NORTH CAROLINA

NOTES AND DETAILS

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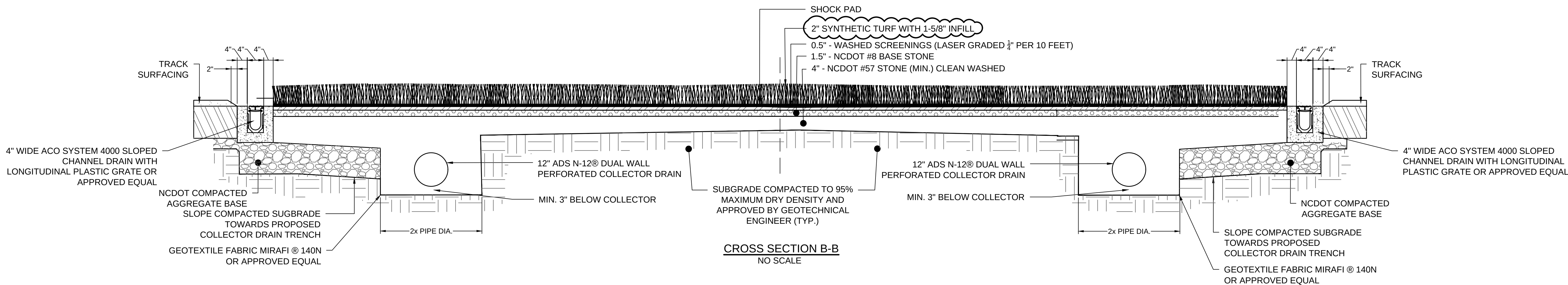
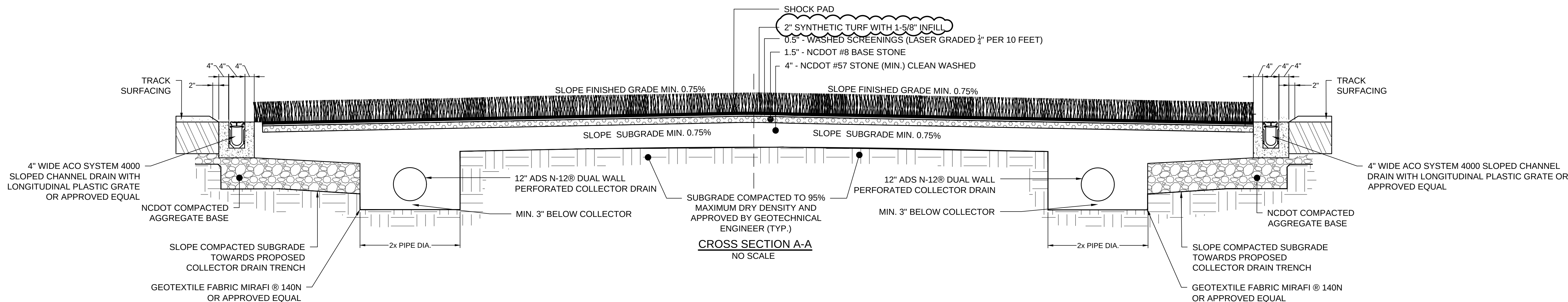
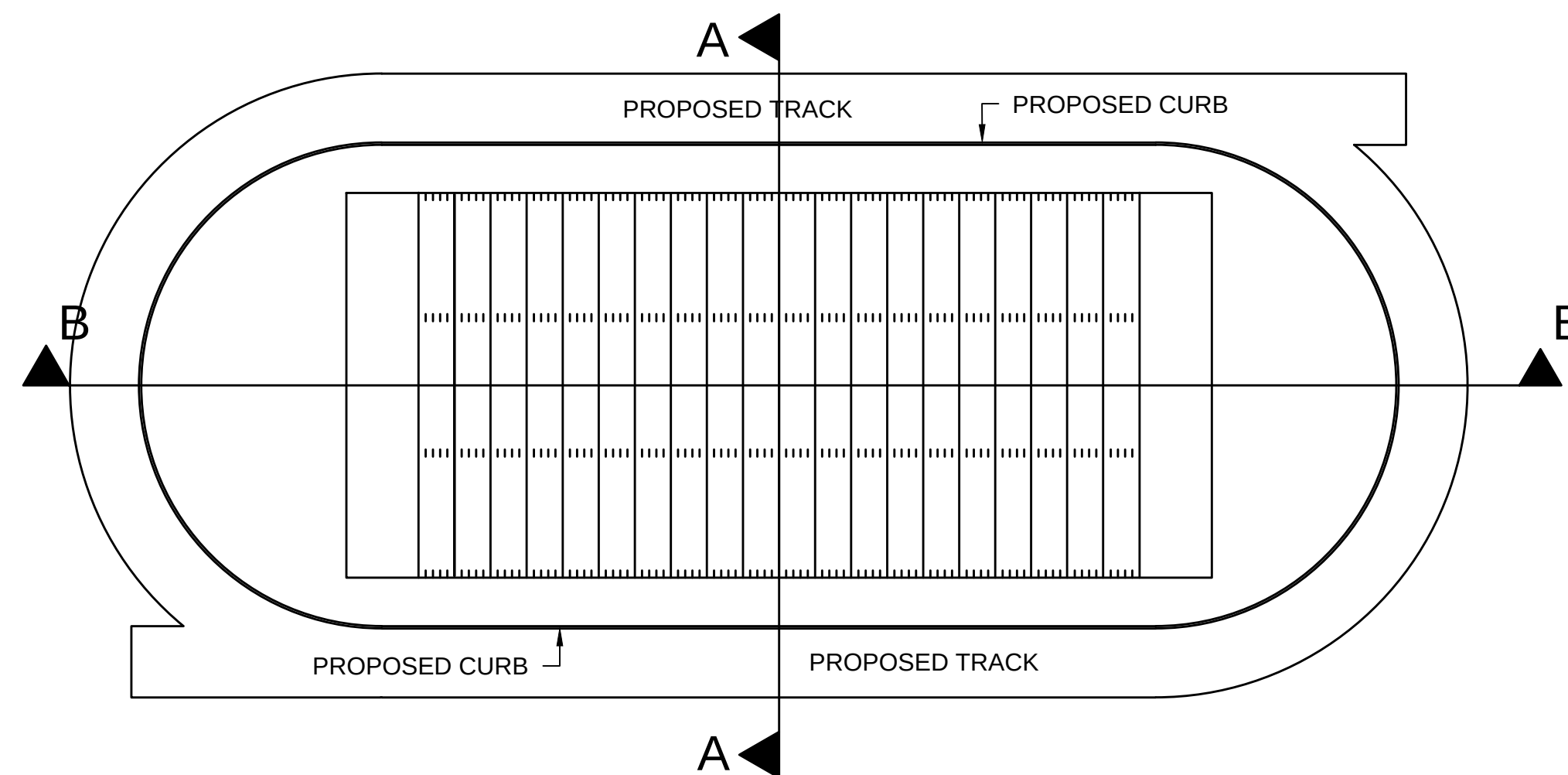
76043

SHEET NO.

C-404



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ATHLETIC FIELD SUBGRADE X-SECTIONS
NO SCALE

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